Vol. 1039 Number 1

OFFICIAL GAZETTE

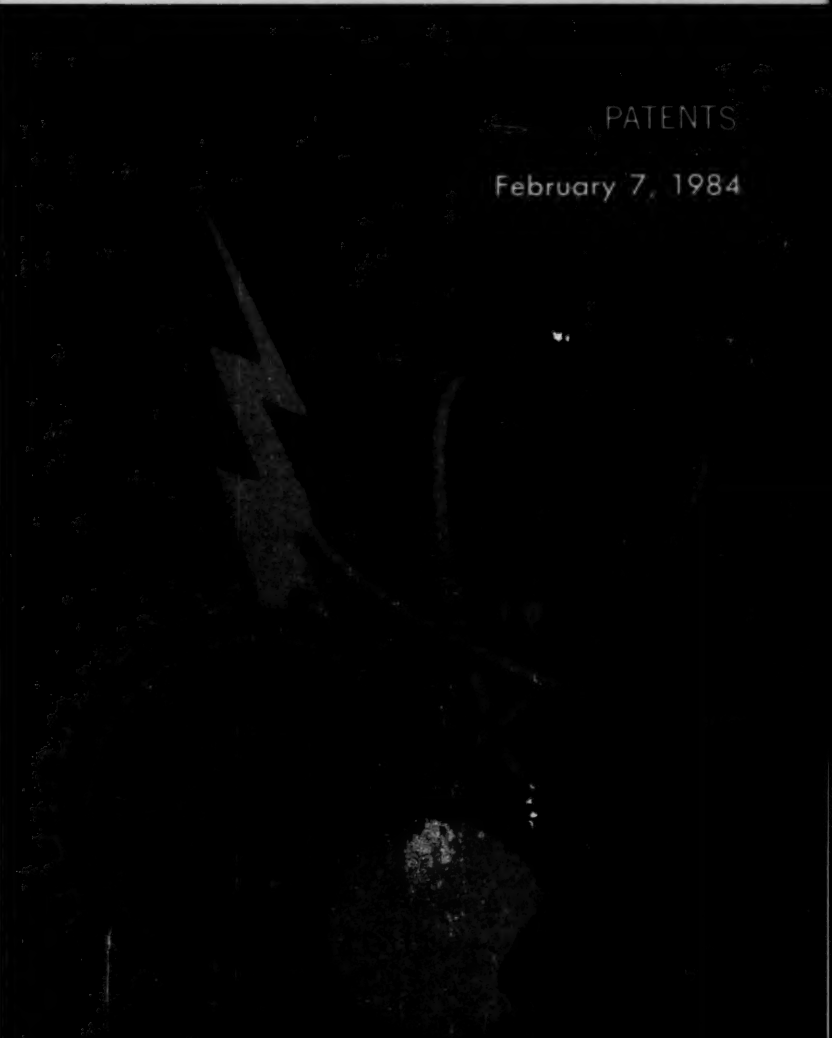
of the

UNITED STATES PATENT AND TRADEMARK OFFICE

Route to:

PATENTS

February 7, 1984



U.S. DEPARTMENT OF COMMERCE

Patent and Trademark Office

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OFFICIAL GAZETTE of the UNITED STATES PATENT AND TRADEMARK OFFICE

February 7, 1984 Volume 1039 Number 1

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.

THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.

GENERAL INFORMATION concerning PATENTS.

GENERAL INFORMATION concerning TRADEMARKS.

PRINTED COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.00 each; PLANT PATENTS in color, $8.00 each; copies of TRADEMARKS at $1.00 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1037 O.G. 12 on Dec. 13, 1983. For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

Domestic PCT fees were increased on Oct. 1, 1982 by a rule change to 37 CFR 1.445 that was published at 1021 O.G. 11 on Aug. 10, 1982. The search fee for the European Patent Office was changed as of Jan. 22, 1983 and was announced at 1025 O.G. 27 on Dec. 28, 1982. International PCT fees were changed by the PCT Assembly effective Jan. 1, 1984 and were announced at 1037 O.G. 12 on Dec. 13, 1983. The current schedule of PCT fees is as follows:

Transmittal fee	$ 125.00
Search fee	
U.S. Patent and Trademark Office as Searching Authority	
· No corresponding prior U.S. national application filed	500.00
· Corresponding prior U.S. national application filed	250.00
European Patent Office as Searching Authority	
· All cases	670.00
International Fees	
Basic Fees (first 30 pages)	295.00
Basic Supplemental Fee (for each page over 30)	6.00
Designation fee (for each national or regional office)	70.00

GERALD J. MOSSINGHOFF,
Nov. 14, 1983. *Commissioner of Patents and Trademarks.*

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

4,303,873, Re. S.N. 553,478, Filed Nov. 18, 1983, Cl. 318/301, RESET WINDUP LIMITING, Royal R. Hawkins, Owner of Record: *Honeywell, Inc., Rockford, Ill.,* Attorney or Agent: James A. Wanner, Ex. Gp.: 217

4,352,266, Re. S.N. 554,524, Filed Nov. 23, 1983, Cl. 56/11.3, LAWN MOWER BRAKE AND CLUTCH DEVICE, Ronald B. Lloyd, et al., Owner of Record: *Outboard Marine, Waukegan, Ill.,* Attorney or Agent: Bayard H. Michael, et al., Ex. Gp.: 333

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.21(b)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

4,287,404, Reexam. No. 90/000,485, Requested: Jan. 6, 1984, Cl. 219/69W, ELECTRODE FOR ELECTRICAL DISCHARGE MACHINING, Danielle Convers, et al., Owner of Record: *Requester,* Attorney or Agent: Hauke and Patalidis, Ex. Gp.: 213, Requester: Ateliers des Charmilles, S.A., Geneva, Switzerland

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National Inventors Day

The Patent and Trademark Office, the National Council of Patent Law Associations and the National Inventors Hall of Fame Foundation, Inc. will sponsor National Inventors Day in the Public Search Room on Saturday, Feb. 11, 1984 from 1:00 p.m. to 5:00 p.m. and Sunday, Feb. 12, 1984 from 10:00 a.m. to 5:00 p.m. The public is invited to view the exhibits on these days. Inventors will be inducted into the National Inventors Hall of Fame on Sunday, Feb. 12, at 2:00 p.m.

In order to assemble exhibits it will be necessary to close the Search Room on Friday, Feb. 10, 1984 at 5:00 p.m. The removal of all personal property from the Search Room would be appreciated.

GERALD J. MOSSINGHOFF,
Dec. 27, 1983. *Commissioner of Patents and Trademarks.*

Errata

The following registration numbers were inadvertently canceled in the "Trademark Registrations Canceled, Section 8" section of the Official Gazettes listed below:

1,004,336	TM 153	Sept. 1, 1981
1,020,498	TM 116	Feb. 9, 1982
1,048,501	TM 452	Feb. 15, 1983
1,054,611	TM 331	May 17, 1983
1,054,612	TM 331	May 17, 1983

Consequently, the above-identified registrations are still active.

MARK M. NEWMAN,
Jan. 9, 1984. *Director, Trademark Examining Operation.*

Errata

The following registration numbers were inadvertently renewed in the "Trademark Registrations Renewed," section of the Official Gazettes listed below:

728,369	TM 443	May 18, 1982
756,140	TM 375	Oct. 18, 1983
754,552	TM 375	Oct. 18, 1983
757,394	TM 375	Oct. 18, 1983
757,862	TM 245	Oct. 11, 1983

Consequently, the above-identified registrations are not renewed.

MARK M. NEWMAN,
Jan. 9, 1984. *Director, Trademark Examining Operation.*

Trademark Exposition

The Patent and Trademark Office is holding its Second Annual National Trademark Exposition in the Tourist Information Center (formerly the "Great Hall" and the Patent Office Search Room) in the Herbert C. Hoover Bldg. (Main Commerce), 14th St. and Constitu-

tion Ave., N.W., Washington, D.C., on Saturday and Sunday, July 7th and 8th, 1984.

There will be a $100.00 fee for exhibitors. Parties wishing to exhibit should contact Peter Harab, at (703) 557-5237.

MARGARET M. LAURENCE,
Assistant Commissioner for Trademarks.

Dec. 16, 1983.

Adverse Decisions in Interference

In the designated interference involving the indicated claims of the following patents, final decision having been rendered that the respective patentees were not the first inventors with respect to the claims listed.

Patent No. 3,830,764, Donald E. Hudgin and Thomas Zawadzki, DEGRADABLE HYDROCARBON POLYMERS, Interference No. 99,900, decided June 15, 1983, claims 5, 6, 15, 17, 18 & 19.

Patent No. 4,072,668, Max S. Amoss, Michael W. Monahan and Wylie W. Vale, Jr., LH-RH ANALOGS, Interference No. 100,186, decided Aug. 24, 1983, claim 5.

Patent No. 4,075,492, Douglas P. Boyd and Michael Goitein, FAN BEAM X- OR GAMMA-RAY 3-D TOMOGRAPHY, Interference No. 100,325, decided Aug. 22, 1983, claims 1–4, 6, 7, 9–15 & 18.

Patent No. 4,140,939, Robert P. Bonazoli, Stephen F. Kimball, III, and Lewis H. Palmer, III, TUNGSTEN HALOGEN LAMP FOR HEADLIGHTS, Interference No. 100,401, decided June 21, 1983, claims 1, 2 & 3.

Patent No. 4,145,669, Richard V. Babcock, John L. Pack and Richard L. Hundstad, CATHODE ELECTRODE CONFIGURATION FOR GAS LASER SYSTEM, Interference No. 100,557, decided June 29, 1983, claim 1.

Patent No. 4,175,136, Lucien Nedelec, Daniel Frechet and Claude Dumont, N-PHENETHYL-N-PROPYL-3,4-DIHYDROXY-PHENETHYL-AMINES AND SALTS THEREOF, Interference No. 100,626, decided Sept. 1, 1983, claims 1–7.

Patent No. 4,197,554, Guenther Meusburger and Karlheinrich Horninger, MONOLITHICALLY INTEGRATED CIRCUIT ARRANGEMENT COMPRISING ONE-TRANSISTOR-STORAGE ELEMENTS, Interference No. 100,905, decided Nov. 30, 1983, claims 1–11.

Patent No. 4,208,094, Walter John Tomlinson, III and Richard Edward Wagner, OPTICAL SWITCH, Interference No. 100,924, decided Nov. 17, 1983, claims 1–16.

Patent No. 4,264,439, Leonard J. Lefevre and Tetsuo Sato, SEPARATION OF ANION AND CATION EXCHANGE RESINS IN A MIXED RESIN BED, Interference No. 100,941, decided Nov. 2, 1983, claims 1, 4–9 & 14.

Patent No. 4,333,010, William H. Miller, DOSE CALIBRATOR LINEARITY EVALUATION, Interference No. 101,040, decided Oct. 14, 1983, claims 1, 7 & 8.

NANNIE B. HENRY,
Deputy Clerk,
Board of Patent Interferences.

PATENT NOTICES

Certificates of Correction for the Week of Feb. 7, 1984

Re. 31,209	4,390,802	4,408,706	4,414,280
4,242,254	4,391,199	4,409,762	4,414,760
4,269,836	4,393,480	4,409,817	4,415,372
4,317,027	4,393,500	4,410,070	4,415,423
4,322,490	4,393,559	4,410,299	4,415,609
4,324,725	4,395,518	4,410,376	4,416,065
4,338,932	4,396,290	4,410,505	4,416,093
4,345,316	4,396,614	4,410,547	4,416,267
4,347,287	4,398,674	4,410,584	4,416,590
4,349,332	4,399,146	4,410,701	4,416,715
4,353,418	4,400,018	4,410,864	4,416,761
4,364,250	4,400,040	4,411,047	4,416,904
4,367,129	4,400,169	4,411,072	4,416,905
4,367,310	4,400,750	4,411,145	4,417,102
4,369,677	4,401,170	4,411,180	4,417,247
4,376,264	4,401,761	4,411,701	4,417,339
4,378,245	4,402,005	4,411,741	4,417,477
4,378,707	4,403,515	4,411,791	4,417,581
4,381,301	4,404,139	4,412,033	4,417,585
4,381,548	4,404,623	4,412,087	4,417,670
4,382,776	4,405,624	4,412,772	4,418,082
4,382,810	4,405,645	4,412,791	4,418,126
4,386,305	4,405,708	4,412,896	4,418,149
4,386,610	4,405,995	4,413,788	4,418,402
4,386,615	4,406,137	4,413,826	4,419,134
4,386,852	4,406,605	4,413,877	4,420,503
4,387,448	4,406,832	4,414,017	
4,390,139	4,407,146	4,414,100	
4,390,285	4,408,591	4,414,195	

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Depending upon the library, the patents may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Auburn University Libraries	(205) 826-4500 Ext.21
	Birmingham Public Library	(205) 254-2555
Arizona	Tempe: Science Library, Arizona State University	(602) 965-7140
California	Los Angeles Public Library	(213) 626-7555 Ext. 273
	Sacramento: California State Library	(916) 322-4572
	Sunnyvale: Patent Information Clearinghouse*	(408) 738-5580
Colorado	Denver Public Library	(303) 571-2122
Delaware	Newark: University of Delaware	(302) 738-2238
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Idaho	Moscow: University of Idaho Library	(208) 885-6235
Illinois	Chicago Public Library	(312) 269-2865
Indiana	Indianapolis—Marion County Public Library	(317) 269-1706
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Engineering Transportation Library, University of Michigan	(313) 704-7494
	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6570
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390, Ext. 391
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
Nevada	Reno: University of Nevada Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7815
New Mexico	Albuquerque: University of New Mexico Library	(505) 277-5441
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 930-0850
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Cambridge Springs: Alliance College Library	(814) 398-2098
	Philadelphia: Franklin Institute Library	(215) 448-1321**
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-7722 Ext. 226
South Carolina	Charleston: Medical University of South Carolina	(803) 792-2372
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8876
Texas	Austin: McKinney Engineering Library, University of Texas	(512) 471-1610
	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-2551
	Dallas Public Library	(214) 749-4176
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

All of the above-listed libraries offer CASSIS (Classification And Search Support Information System), which provides direct, on-line access to Patent and Trademark Office data.

*Collection organized by subject matter.

**Call only between the hours of 10:00 a.m. and 5:00 p.m.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF April 2, 1983

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—D. E. TALBERT, Director ..... Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	1-16-81
GENERAL ORGANIC CHEMISTRY, GROUP 120—C. E. VAN HORN, Director ..... Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	11-20-81
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—J. O. THOMAS, JR., Director .... Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g., Coating; Molding; Ink; Prosthdontics; Adhesive and Abrading Compositions; Molding, Shaping, Treating Process, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	3-1-82
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—S. N. ZAHARNA, Director ..... Coating: Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	3-09-82
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. F. WHITE, Director ..... Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	1-12-82
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—S. W. ENGLE, Director Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	5-22-81
SPECIAL LAWS ADMINISTRATION, GROUP 220—KENNETH L. CAGE, Director ..... Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear Reactors; Acoustics, Communications, Optics; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptography; Laser Devices; Radioactive Materials; Powder Metallurgy, Rocket Fuels; Special, Fuel, Explosive and Thermic Compositions; Thermal and Photoelectric Batteries.	3-30-81
INFORMATION TRANSMISSION, STORAGE, AND RETRIEVAL, GROUP 230—EARL LEVY, Director ..... Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	1-05-81
RECEPTACLES, CLEANING, WINDING, AND MEASURING, GROUP 240—G. M. FORLENZA, Director ..... Receptacles; Bearings; Joint Packing; Conduits; Switches; Presses; Plumbing Fixtures; Textile Spinning; Cleaning; Food Treating; Agitating; Centrifugal Separating; Geometrical Instruments; Sound Recording; Image Projectors; Web Feeding; Winding and Reeling; Cable Hoists; Measuring and Testing; Indicating; Fluent Material Handling; Shaft; Impellers; Rotary Fluid Motors.	5-12-81
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director ..... Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	8-25-80
DESIGN, GROUP 290—KENNETH L. CAGE, Director ..... Industrial Arts; Household, Personal and Fine Arts.	1-30-81
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director ..... Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	5-18-81
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—STEPHEN G. KUNIN, Director Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	7-27-81
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—R. E. AEGERTER, Director ..... Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	8-27-82
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director ..... Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Couplings; Gearing; Fluid Handling and Control; Lubrication.	11-17-80
GENERAL CONSTRUCTIONS, TEXTILES, MINING AND GEARING, GROUP 350—A. L. SMITH, Director ..... Building Structures; Racks; Cabinets; Closures; Supports; Furniture; Fasteners; Locks; Pipe Couplings; Joints; Miscellaneous Hardware; Textiles; Sewing Machines; Apparel; Footwear; Earth Engineering; Earth Drilling; Mining; Wells; Roads; Bridges; Tool Driving; Gearing; Machine Elements; Clutches.	9-17-80

Expiration of patents: The patents within the range of numbers indicated below expire during April 1983, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,243,822 to 3,248,737, inclusive

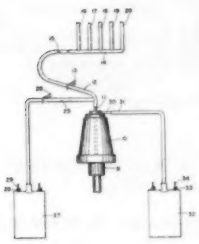
Plant Patents ..... Numbers 2,616 to 2,627 inclusive

REEXAMINATIONS

FEBRUARY 7, 1984

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 3,634,228 (158th)
STERILE WASHING METHOD AND APPARATUS
Allen Latham, Jr., Jamaica Plain, Mass., assignor to Cryogenic Technology, Inc., Waltham, Mass.
Reexamination Request No. 90/000,307, Dec. 14, 1982.
Reexamination Certificate for Patent No. 3,634,228, issued Jan. 11, 1972, Ser. No. 868,533, Oct. 22, 1969.
Int. Cl.[3] B04B *15/00*
U.S. Cl. 210—636



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **8–10** is confirmed.

Claims **1**, **5**, and **11** are determined to be patentable as amended:

Claims **2–4**, **6**, **7**, and **12**, dependent of amended claims, are determined to be patentable.

New claims **13–18** are added and determined to be patentable.

1. An apparatus for processing a liquid by treatment with another treating liquid *within a fluid-tight vessel* while maintaining the interior of the apparatus in a sterile condition[,] comprising in combination:

(a) a source of said liquid and *a source of* said treating liquid;
(b) an internally [sterilizable] *sterilized* fluid-tight vessel having *a sterile gas entrapped therein; said sterile gas comprising a gaseous means for enabling transfer of liquid and* separate fluid inlet and fluid discharge means;
(c) a first fluid conduit providing fluid communication between said inlet means of said vessel and said source of said liquid and said *source of* treating liquid;
(d) a first flexible-wall pouch in fluid communication with said first fluid conduit through a second fluid conduit;
(e) means to selectively control the flow of fluid in said first and second conduits; and
(f) a second flexible-wall pouch *constituting the only item* in fluid communication with said discharge means of said vessel through a third fluid conduit, *said third fluid conduit constituting the only path of fluid communication to or from said second flexible-wall pouch.*

B1 3,720,760 (159th)
METHOD FOR DETERMINING THE PRESENCE OF REAGIN-IMMUNOGLOBULINS (REAGIN-IG) DIRECTED AGAINST CERTAIN ALLERGENS, IN AQUEOUS SAMPLES
Hans H. Bennich, Uppsala; Stig G. O. Johansson, Storvreta, and Leif E. Wide, Uppsala, all of Sweden, assignors to Pharmica, Inc., Piscataway, N.J.
Reexamination Request No. 90/000,199, May 14, 1982.
Reexamination Certificate for Patent No. 3,720,760, issued Mar. 13, 1973, Ser. No. 758,131, Sep. 6, 1968.
Int. Cl.[3] G01N *33/60*
U.S. Cl. 436—513

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–24** is confirmed.

Claims **25** and **26** are determined to be patentable as amended:

1. An in vitro method for analyzing a body fluid so as to obtain an indication as to the amount of reagin-immunoglobulins therein that are reactive with one or more allergens capable of producing allergic reactions in humans and animals which method comprises:

(a) contacting an aqueous sample derived from body fluid with a water-insoluble polymer to which is attached at least one test allergen by bonds capable of withstanding normal washing procedures,
(b) continuing the contacting set forth in step (a) for a long enough time to allow reaction between said polymer attached test allergen and any reagin-immunoglobulins in the aqueous sample of body fluid that are reactive therewith,
(c) contacting the product of step (b) with antibodies that have atoms or groups capable of emitting radiation for labelling purposes and which antibodies are reactive with the reagin-immunoglobulins that would be reactive with the test allergen,
(d) separating the product of step (c) into a liquid phase and a solid phase, and
(e) measuring the radiation emitted from at least one of the phases separated in step (d).

26. [Reagin-Ig] *Substantially pure reagin-Ig* which has been labelled with a radioactive isotope of iodine.

B1 4,034,210 (160th)
CREDIT CARD CARRIERS AND METHODS OF MANUFACTURE
James E. Hill, Prospect Heights; Baesley I. Dahlstrom, Des Plaines, and Robert D. Fisher, Melrose Park, all of Ill., assignors to Dynetics Engineering Corporation, Wheeling, Ill.
Reexamination Request No. 90/000,269, Oct. 13, 1982.
Reexamination Certificate for Patent No. 4,034,210, issued Jul. 5, 1977, Ser. No. 615,112, Sep. 19, 1975.
Int. Cl.[3] G06K *19/00*
U.S. Cl. 235—487

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims **1**, **55**, and **63** are determined to be patentable as amended:

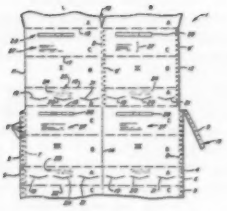
Claims **2–54**, **56–62**, and **64–65**, dependent on amended claims, are determined to be patentable.

1. Improved credit card carriers *for retaining cards without glue during automated credit card issue and mailing operations by automated credit card insertion machines comprising in operative combination:*

a. a web of sheet material having a pair of substantially parallel side edges, a top edge and a bottom edge;

b. a plurality of foldable panels defined *in said sheet material* by fold lines disposed medially of, and substantially parallel to, said top and said bottom edges, *the dimension between said top edge and said adjacent fold line, between said bottom edge and said adjacent fold line, and between said fold lines, defining the width, respectively, of each of said panels;*

c. a plurality of means for receivingly engaging credit cards disposed in at least one of said panels *so that at least one edge of each of said cards is cooperatingly engaged between adjacent panels;*



d. at least one of said plurality of panels, adjacent said panel having said receivingly engaging means, having a width,

as compared to, respectively,

i. the length of said credit card when said credit card is disposed in said receivingly engaging means in a vertical orientation, and

ii. the width of said credit card when said credit card is disposed in said receivingly engaging means in a horizontal orientation, sufficient to engage an edge of said card between at least two adjacent panels folded one onto the other adjacent one of said fold lines without substantially binding said adjacent panels; and

e. [d.] said panels being *operatively* adapted to *retainingly* wedge trap said cards when folded with said cards disposed between said panels *by the cooperation of said receivingly engaging means and the engagement of at least one edge of said cards between adjacent panels to prevent said cards from becoming canted or loose in the folded carrier.*

B1 4,059,405 (161st)

METHOD AND APPARATUS FOR ANALYSIS OF CONSTITUENT CARRIED IN FIBROUS MEDIUM

Lester A. Sodickson, Newton, Mass., and Franklin Lim, Richmond, Va., assignors to Damon Corporation, Needham Heights, Mass.

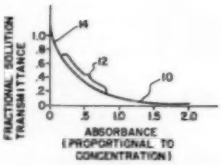
Continuation-in-part of Ser. No. 243,068, Apr. 11, 1972, abandoned and a continuation-in-part of Ser. No. 498,646, Aug. 19, 1974, abandoned.

Reexamination Request Nos. 90/000,171, Mar. 1, 1982 and 90/000,312, Jan. 12, 1983.

Reexamination Certificate for Patent No. 4,059,405, issued Nov. 22, 1977, Ser. No. 715,855, Aug. 19, 1976.

Int. Cl.[3] **G01N** *21/24, 33/16, 21/64, 35/00*

U.S. Cl. 436—44



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **31**, **32** and **36** is confirmed.

Claim **25** having been finally determined to be unpatentable, is cancelled.

Claims **1**, **2**, **5**, **13**, **14**, **16**, **18**, **21–23**, **26–29** and **33–35** are determined to be patentable as amended:

Claims **3–4**, **6–12**, **15**, **17**, **19**, **20**, **24** and **30**, dependent on an amended claim, are determined to be patentable.

New claims **37–39** are added and determined to be patentable.

1. In the constituents analysis of sample material on a porous medium, by reaction in a liquid state with reactants to produce a constituent-manifesting reaction product *and wherein the medium is absorbent to the sample in liquid state*, the improvement comprising the steps of

A. producing said reaction product *within said porous medium* at said analysis site with only an optically-thin concentration,

B. illuminating said analysis site with incident electromagnetic radiation,

C. sensing, from a field of view coincident with said analysis site, electromagnetic radiation that is resultant from said incident radiation and responsive to both the background response of said medium to said illumination and the concentration of said reaction product, and

D. producing a sample-measuring signal in response to a differential function of said product-responsive sensed radiation and radiation resultant from incident radiation on said field of view and responsive to said background response of said medium at said analysis site and to said sample material and said reagents prior to said product-producing reaction.

DEFENSIVE PUBLICATIONS

PUBLISHED FEBRUARY 7, 1984

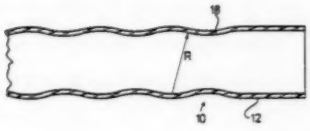
Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O.G. 687. The abstracts of Defensive Publication applications are identified by distinctly numbered series and are arranged chronologically. The heading of each abstract indicates the number of pages of specification, including claims and sheets of drawings contained in the application as originally filed. The files of these applications are available to the public for inspection and reproduction may be purchased for 30 cents a sheet.

Defensive Publication applications have not been examined as to the merits of alleged invention. The Patent and Trademark Office makes no assertion as to the novelty of the disclosed subject matter.

T103,901
WAVE WALLED PIPE

Manfred A. A. Lupke, 35 Ironshield Crescent, and Gerd P. H. Lupke, 46 Stornoway Crescent, both of Thornhill, Ontario, Canada (L3T 3K7)

Filed May 5, 1981, Ser. No. 260,708
Int. Cl.³ F16L *11/06*
U.S. Cl. 138—122
1 Sheets Drawing. 9 Pages Specification



A substantially stiff thin walled plastic pipe of thermoplastic material is provided having a wall of substantially uniform thickness, the longitudinal cross section profile of the wall comprising a wave form having a ratio of pitch length to amplitude of at least 3 to 1 and ranging to as high as 15 to 1.The wall wave form can be provided as at least one peripheral groove extending spirally along the pipe, to provide a substantially non-varying flow-section; or as succeeding annular grooves and crests, whereby the flow-section varies recurrently from a maximum to a minimum value. The pipe may be produced having an integral bell housing end portion, for joinder to a succeeding pipe length or it may be produced as a continuous length. Production of the continuous length pipe can be made on machines employing travelling mould blocks, or on rotary die types of machines.

T103,902
DRILLING FLUID UTILIZING GRANULAR STARCH FOR FLUID LOSS CONTROL

Norman K. Dart, 905 Dee Lee La., Mt. Zion, Ill. 62549, and James E. Eastman, 345 S. Westdale Ave., Decatur, Ill. 62522

Filed Nov. 1, 1982, Ser. No. 438,089
Int. Cl.³ C09K *7/00*; C13L *1/00*; E21C *7/06, 7/08*
U.S. Cl. 252—8.5 C
No Drawing. 25 Pages Specification

An improved aqueous drilling fluid having low fluid loss and effective viscosity control is obtained by the addition of a cold-water-swelling granular corn starch material which consists essentially of substantially intact, partially swollen granules which appear nonbirefringent under a polarizing microscope and which have a cold-water solubility of at least 50%. The improved drilling fluids exhibit better controlled fluid loss and viscosity stability at temperatures up to 250° F. than do drilling fluids containing most present commercially available starch-based fluid loss control agents.

T103,903
FLOORING FELT COMPOSITIONS AND METHOD FOR PREPARING THE SAME

Conrad J. Campbell, Skyline Orchard, Box 164, Hockessin, Del. 19707, and William D. Willis, 4636 Bailey Dr., Limestone Acres, Wilmington, Del. 19808

Continuation of Ser. No. 394,048, Jun. 30, 1982, abandoned. This application Jun. 3, 1983, Ser. No. 500,718
Int. Cl.³ D21H *1/38, 5/12*; D21F *11/00*
U.S. Cl. 523—206
No Drawing. 25 Pages Specification

Flooring felt compositions having dimensional and thermal stability and resistance to water and high humidity as well as the necessary mechanical properties to provide satisfactory backing for the thermoplastic vinyl resins ordinarily used as floor coverings can be prepared by forming an anionic aqueous fiber dispersion of from about 4 to about 55% and preferably from about 8 to about 35% of water dispersible spurted polyolefin fibers, from about 2 to about 30% of wood pulp fibers, from about 2 to about 20% water dispersible glass fibers, from about 1 to about 10% of an anionic polyacrylamide resin, from about 0 to about 50% of an inorganic filler, from about 5 to about 25% of an anionic, elastomeric polymeric binder and from about 1 to about 10% of a cationic resin (all percentages of the above components are by weight, based on the dry weight of flooring felt composition) and then passing the resulting dispersion through a paper making machine to form a fibrous sheet material.

REISSUES

FEBRUARY 7, 1984

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 31,515

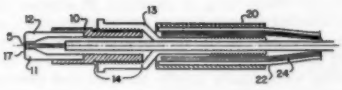
FIBER OPTIC CONNECTOR

Earl R. Heldt, Monta Vista, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Original No. 4,114,979, dated Sep. 19, 1978, Ser. No. 792,375, Apr. 29, 1977. Continuation-in-part of Ser. No. 731,068, Oct. 8, 1976, abandoned. Application for reissue Sep. 18, 1980, Ser. No. 188,403

Int. Cl.³ G02B *7/26*

U.S. Cl. 350—96.21 **9 Claims**



8. A fiber optic cable sleeve of resilient material having a D-shaped inside diameter for accepting a plurality of fiber optic cable ferrules inserted therein, said D-shaped inside diameter axially aligning said ferrules by snugly fitting and applying a force orthogonal to the longitudinal axis of said inserted ferrules.

Re. 31,516

FILMSTRIP METERING DEVICE FOR A CAMERA

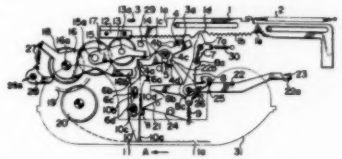
Harumi Tanaka, Kobe, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Original No. 4,107,715, dated Aug. 15, 1978, Ser. No. 839,814, Oct. 6, 1977. Continuation of Ser. No. 716,232, Aug. 20, 1976, abandoned. Application for reissue Aug. 13, 1980, Ser. No. 177,614

Claims priority, application Japan, Aug. 21, 1975, 50/114328

Int. Cl.³ G03B *17/42*

U.S. Cl. 354—206 **12 Claims**



12. A camera in which a film cartridge may be inserted, the cartridge containing a film wind-up gear and a filmstrip which is wound-up by the rotation of said wind-up gear, the camera comprising:

a manually operable wind-up member mounted on the camera for movement for supplying film wind-up force;

transmission means mechanically connected to said wind-up member for transmitting the film wind-up force from said wind-up member to said wind-up gear, said transmission means including a fixed gear capable of being operatively coupled with said wind-up gear for rotating the same, a displaceable gear rotatable by the film wind-up force from said wind-up member and meshing said fixed gear and a swingable mounting member coaxially arranged with said fixed gear and mounting said displaceable gear for rotation, said mounting member being swingable so that said displaceable gear displaces along the periphery of said fixed gear, and said transmission means being of the construction wherein the rotation of said displaceable gear without the displacement causes the rotation of said fixed gear while the displacement of said displaceable gear causes said transmission means to be disconnected from said wind-up member such that the film wind-up force is no longer transmitted from said wind-up member to said wind-up gear;

means for locking said mounting member so that said mounting member is prevented from swinging; and,

sensing means responsive to completion of one frame film wind-up for causing said locking means to unlock said mounting member and for holding the filmstrip to thereby arrest said fixed gear, the swinging of said mounting member being caused by the rotation of said displaceable gear with said fixed gear being arrested and with said mounting member being unlocked.

Re. 31,517

METHOD FOR QUANTITATIVE DETERMINATION OF RENIN ACTIVITY IN BLOOD EMPLOYING PHENYL METHYL SULFONYL FLUORIDE AND POLYETHYLENE GLYCOL

Aurora L. Fernandez de Castro, 54657 David Dr., Elkhart, Ind. 46514

Original No. 3,984,532, dated Oct. 5, 1976, Ser. No. 611,669, Sep. 9, 1975. Continuation-in-part of Ser. No. 419,623, Nov. 28, 1973, Pat. No. 3,919,407. Application for reissue Sep. 15, 1978, Ser. No. 943,251

The portion of the term of this patent subsequent to Nov. 11, 1992, has been disclaimed.

Int. Cl.³ G01N *33/54, 33/56;* C12Q *1/34, 1/44*

U.S. Cl. 436—539 **2 Claims**

1. In a method for measuring plasma renin activity in a sample of plasma comprising adding ethylene diamine tetra-acetic acid, adding inhibitor to inhibit Angiotensin I destruction, incubating at about 37° C. to release Angiotensin I from the plasma sample, adding I^{125} labeled Angiotensin I while adding antibody, incubating the labeled mixture sample and antibody and adding a material to separate free Angiotensin I from Angiotensin I bound to antibody prior to determining the amount of Angiotensin I that improvement consisting of:

adding phenyl methyl sulfonyl fluoride as the inhibitor;

adjusting the pH from 5 to 7.5 after adding the inhibitor;

incubating the labeled mixture of sample and antibody for 1 to 2 hours at about 23° C. to 30° C. after the incubation at 37° C. to yield Angiotensin I for measurement;

separating the free Angiotensin I from the Angiotensin I bound to antibody with polyethylene glycol in 0.01 Molar Tris hydroxymethyl aminomethane at pH 7 in a concentration of 12% to 18% based on the total medium, in the presence of about 100 μl to 250 μl of serum or any equivalent material containing similar quantities of immunoglobulins to aid precipitation of immunoglobulins in the plasma; and,

said incubating and separating steps being carried out one after the other, allowing for the optimal yield of Angiotensin I to be obtained in the same day that the sample is received and minimizing time dependent errors occurring therein.

Re. 31,518

DYNAMICALLY PARTIALLY CURED THERMOPLASTIC BLEND OF MONOOLEFIN COPOLYMER RUBBER AND POLYOLEFIN PLASTIC

William K. Fischer, Meaford, Canada, assignor to Uniroyal, Inc., New York, N.Y.

Original No. 3,806,558, dated Apr. 23, 1974, Ser. No. 171,328, Aug. 12, 1971. Application for reissue May 1, 1978, Ser. No. 901,400

Int. Cl.[3] **C08L** *23/26, 23/32, 23/36, 23/16*

U.S. Cl. 525—194 **13 Claims**

5. A method of making a thermoplastic elastomeric blend comprising dynamically working and shearing from 60 to 80 parts by weight of a rubbery copolymer of at least two different alpha-monoolefins, one of which is ethylene, with at least one copolymerizable polyene, in admixture with correspondingly 40 to 20 parts by weight of a polyolefin resin selected from the group consisting of polyethylene and polypropylene, at a temperature of from 160° F. to 550° F. in the presence of a curative for from 3 to 20 minutes to produce a gel content in the blend of from 60 to 93% measured in cyclohexane at 73° F., the partial cure thus imparted to the blend being insufficient to render the blend unprocessable, *and substantially exhausting the action of the curative so that the thus partially cured blend has little or no tendency for further advancement of cure to take place subsequently.*

Re. 31,519

LEAD-IN SEAL AND LAMP UTILIZING SAME

John C. Sobieski, Gates Mills, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Original No. 4,110,657, dated Aug. 29, 1978, Ser. No. 776,850, Mar. 14, 1977. Application for reissue Nov. 12, 1982, Ser. No. 441,187

Int. Cl.[3] **H01J** *5/36*

U.S. Cl. 313—332 **12 Claims**

1. A seal comprising an envelope of vitreous material, a conductive foil seal member, an elongated electrical conductor positioned to have an end thereof axially spaced from an edge of said foil seal member, and a conductive foil tab member extending substantially axially between and interconnecting said foil seal member and said elongated conductor, said foil seal member being hermetically sealed in said material of the envelope, *said tab member being provided with a double bend to provide an angled intermediate region joining first and second end regions thereof which lie in parallel planes, said first end region overlapping and being attached to a region of said foil member and said second and region overlapping and being attached to the end region of said elongated conductor.*

PLANT PATENTS

GRANTED FEBRUARY 7, 1984

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

5,188

PLANT OF THE ARACEAE FAMILY

Robert J. Coody, Rte. 1, Box 136, Fort Lawn, S.C. 29714

Filed May 20, 1982, Ser. No. 380,062

Int. Cl.[3] A01H *5/00*

U.S. Cl. Plt.—88 **1 Claim**

1. The new and distinct variety of the Araceae family as described and illustrated and which combines the following principal distinguishing characteristics:

(1) a plant specimen which in size is generally smaller than those of the 'Mauna Loa' variety of the *Spathiphyllum* species,

(2) foliage that includes leaf blades which are variegated and provided with a basic chlorophyllous field that contains streaks and blotches which in colors are generally lighter than those of the basic chlorophyllous field and which also vary in color, pattern and size within the leaf blades and from one leaf blade to the next, and

(3) an inflorescence with a spathe that shortly after initial expansion is provided with variegated blades which have a basic achlorophyllous field that contains chlorophyllous streaks and blotches and merges distally in the spathe with a chlorophyllous tip area which extends proximally in the leaf blade further than that of the 'Mauna Loa' variety of the *Spathiphyllum* species, the spathe coloration changing as the spathe matures to provide variegated blades that have a basic chlorophyllous field which contains chlorophyllous and nearly achlorophyllous streaks and blotches that are generally lighter in color than those found in the basic chlorphyllous field.

PATENTS

GRANTED FEB. 7, 1984

ERRATA

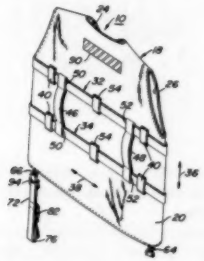
For CLASS	See PATENT NO.
604–073	4,429,693
123–198	4,429,853
384–094	4,429,854
254–018	4,429,857
254–134	4,429,858
502–162	4,430,252
502–185	4,430,253
502–243	4,430,254
381–097	4,430,527
330–149	4,430,619

PATENTS

GRANTED FEBRUARY 7, 1984

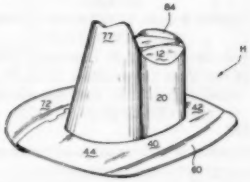
GENERAL AND MECHANICAL

4,429,419
SAFETY GARMENT
Robert Z. Snyder, 1141 Harriett Rd., Huntingdon Valley, Pa. 19006
Filed Jan. 15, 1982, Ser. No. 339,620
Int. Cl.³ A41D *1/04;* **A41F** *9/00, 19/00*
U.S. Cl. 2—102 **15 Claims**



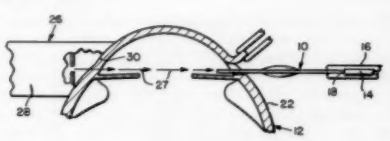
1. A safety garment adapted to be worn by a driver of a vehicle, comprising:
(a) a vest member substantially encompassing the torso of said driver;
(b) a first belt member encircling said vest member;
(c) a second belt member encircling said vest member, said second belt member being vertically displaced from said first belt member;
(d) hand grip means coupled to said first and second belt members for providing a hand grip for a passenger located to the rear of said driver; and,
(e) means for vertically constraining displacement of said first and second belt members on said vest member, said vertical constraining means including a plurality of belt loop members fixedly secured to said vest member, each of said first and second belt members passing through at least one of said belt loop members.

4,429,420
COWBOY HAT
Natalie A. Wolff, Arlington, Tex., assignor to Container Corporation of America, Chicago, Ill.
Filed Jun. 21, 1982, Ser. No. 390,310
Int. Cl.³ A42B *1/00*
U.S. Cl. 2—175 **5 Claims**



1. A cowboy hat formed from a single sheet of paperboard which is cut and scored, said hat comprising:
a flat top portion having side edges;
a generally rectangular-shaped crown section;
a first elliptical-shaped crown connecting portion foldably joined between one side edge of said top portion and said rectangular-shaped crown section;
a generally crescent-shaped crown section;
a second elliptical-shaped crown portion foldably joined between the other side edge of said top portion and said crescent-shaped crown section;
interconnecting panels foldably joined to ends of said crescent-shaped crown section;
a C-shaped brim section including a central portion, an upper crescent-shaped portion and a lower crescent-shaped portion;
said central portion of the C-shaped brim section being foldably joined to said rectangular-shaped crown section;
an arcuate-shaped brim section foldably joined to said crescent-shaped crown section;
first interlocking means formed on said upper and lower portion of said C-shaped brim section and said arcuate-shaped brim section;
second interlocking means formed on said rectangular-shaped crown section and said interlocking panels;
a first brim extension of an arcuate shape being foldably joined to said C-shaped brim section; and
a second brim extension of an arcuate shape being foldably joined to said arcuate-shaped brim section.

4,429,421
METHOD OF IMPLANTING AN INTRAOCULAR LENS
Chauncey F. Levy, 1 Surrey La., Pittsford, N.Y. 14534
Filed Feb. 3, 1982, Ser. No. 345,330
Int. Cl.³ A61F *1/16, 9/00;* **A61B** *17/00*
U.S. Cl. 3—13 **5 Claims**

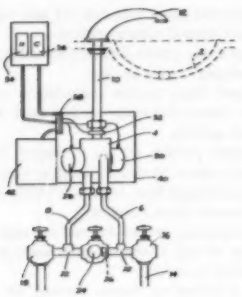


1. Method of implanting an intraocular lens or the like in an eye comprising the steps of making an incision in the eye to admit the lens, directing light into the lens through an edge thereof thereby to cause the edges of the lens to glow, and inserting the lens through the incision into the interior of an eye chamber while continuing to direct light into the lens.

4,429,422
FLOW CONTROL DEVICE
Oliver N. Wareham, 4 Castlereagh Crescent, Sylvania Waters, N.S.W. 2224, Australia
Filed Oct. 9, 1981, Ser. No. 310,299
Int. Cl.³ E03C *1/05*
U.S. Cl. 4—192 **17 Claims**

1. A liquid flow control device for delivering from a hot water supply and a cold water supply either cold water or hot water mixed with cold water, said flow control device comprising a chamber having a first inlet, a second inlet and a discharge outlet for connection to a sink delivery fitting, means connecting said first inlet to said cold water supply means for connecting said second inlet to said hot water supply, means for connecting said first inlet to said second inlet by a breech pipe, a one way valve interposed in said breech pipe for preventing the transfer of hot water to said first inlet while permitting transfer of cold water to said second inlet, a solenoid operated valve which stops and starts the flow of water through said first inlet into said chamber, a solenoid operated

valve which stops and starts the flow of water through said second inlet into said chamber, and switch means for control-



ling said solenoids so that some cold water flows through the liquid flow control device each time it operates.

4,429,423

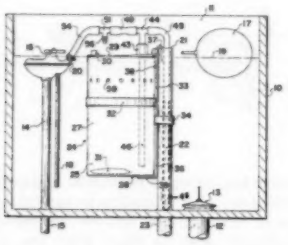
COMBINATION WATER SAVER AND DISINFECTANT DISPENSER

Marius H. Syrenne, 1604-9th Ave. North, Saskatoon, Saskatchewan, Canada S7K 3A1

Continuation-in-part of Ser. No. 249,493, Mar. 31, 1981, abandoned. This application Jun. 7, 1983, Ser. No. 501,846

Int. Cl.³ E03D *9/03*

U.S. Cl. 4—225 **1 Claim**



1. In a toilet assembly which includes a water tank connected to a water supply, an inlet assembly controllable by a float valve component, a toilet bowl operatively connected to said tank, an overflow pipe extending upwardly into the tank and connected to the bowl and having an outlet conduit operatively connected to the inlet assembly and to the overflow pipe for communicating water from said inlet assembly to the overflow pipe for replacing the water seal in the bowl after the flushing action, a disinfectant holding container, means to detachably secure said container within the tank, venturi means in said outlet conduit and an extractor conduit means extending from the outlet conduit downstream of the venturi downwardly into the container to adjacent the base thereof whereby water with said container is extracted from the container by water passing through the outlet conduit to said overflow pipe; the improvement comprising means for filling the container from the water within the tank, siphoning means provided by an extension portion of said outlet conduit so as to extend to a position below said extractor conduit means whereby to increase the flow of water from said container to said overflow pipe, and an opening in the outlet conduit arranged above said water level of the tank when operatively full, upstream of said venturi and downstream of said inlet assembly.

4,429,424

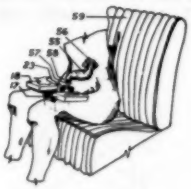
OSTOMY COLLECTOR-ORGANIZER DEVICE

Nelson D. Waldner, 8782 Sea Spray Dr., Huntington Beach, Calif. 92646

Filed Jun. 24, 1982, Ser. No. 391,532

Int. Cl.³ A47K *11/00*

U.S. Cl. 4—479 **5 Claims**



1. A portable, stable, collector-organizer device for receiving body waste through the drain opening of an ostomy collector bag, comprising:

a. an open container having compartments for storing receptacles adapted to receive and collect body waste from the drain opening, lids for closing the receptacles, and wiping towels and tissues for cleaning and wiping the drain opening;

b. front, rear and side walls enclosing the container;

c. a support pad positioned forwardly of the front wall and centrally of the device, the pad being adapted to support the receptacle;

d. means for releasably securing the receptacle on the pad; and,

e. upwardly extending arms from the walls terminating in horizontal support platforms;

the device being adapted, when in use, to be stabilized and secured: i. along the sidewalls between a user's legs when seated; and, ii. by the platforms resting upon the top of the user's legs; whereby, the user is enabled to insert the drain opening of the ostomy collector bag into the discharge receptacle and thereby drain the contents of the ostomy collector bag into the receptacle.

4,429,425

SWIMMING POOL COVER OR DOME BEAD CONSTRUCTION

Donald H. Weir, and Donald E. Dahowski, both of York, Pa., assignors to Fox Pool Corporation, York, Pa.

Filed Aug. 4, 1982, Ser. No. 404,997

Int. Cl.³ E04H *3/16, 3/18*

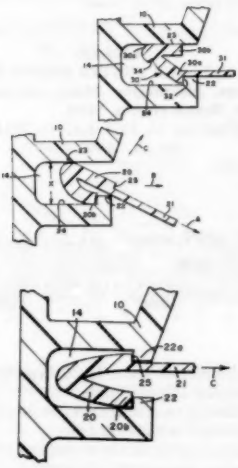
U.S. Cl. 4—503 **5 Claims**

1. In combination, a swimming pool cover provided with a peripheral bead to hold said cover in position, said bead being adapted to be inserted into a longitudinal bead holding channel member said channel member being open in the direction facing the pool and being provided with at least one vertical retaining lip contiguous to the channel opening to engage a mating face on said bead, said channel member being positioned contiguous to the swimming pool coping, and said bead characterized in having:

(a) a cross section resembling a hook-like configuration which is insertable horizontally into said channel,

(b) a transverse dimension which extends substantially across the entire vertical dimension of said channel,

(c) the free end of said hook-like configuration abutting against the vertical retaining lip of said channel, and



(d) having a longitudinal dimension which increasingly resists withdrawal of the bead from the channel as the bead is rotated from a horizontal position.

4,429,426

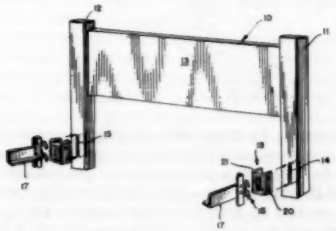
BRACKET FOR SECURING A MATTRESS SUPPORTING MEMBER TO A BEDPOST

Kenneth H. Gutner, Highland Park, Ill. 60035

Filed Oct. 13, 1981, Ser. No. 310,880

Int. Cl.³ A47C *19/00*

U.S. Cl. 5—288 **6 Claims**



1. A bracket for securing a mattress-supporting member to a bedpost comprising a generally rectangular unitary metal element having a central planar portion and an integral return-bend flange along two opposing sides, each of said flanges projecting perpendicularly away from said central planar portion and providing spaced apart walls adapted to receive the hook means of a bedrail, a pair of spaced apart hook supporting means connecting said walls of each flange and integrated therewith to facilitate insertion of either of said flanges into an elongated slot of a bedpost and means in said central planar portion for securing said bracket to a bed end board.

4,429,427

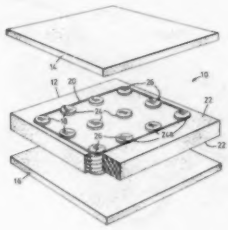
SEATING CUSHION

Joseph Sklar, Toronto, Canada, assignor to Sklar-Peppler Inc., Whitby, Canada

Filed Apr. 19, 1982, Ser. No. 369,462

Int. Cl.³ A47C *27/20, 27/05, 27/07*

U.S. Cl. 5—474 **2 Claims**



1. A seat cushion comprising:

(a) a main body panel of cushion type foam material having a pair of oppositely disposed seating faces, a plurality of spring mounting passages opening through said main body in a seating area thereof, said passages extending perpendicularly between said seating faces, said passages including perimeter passages located along the perimeter of the seating area, and inboard passages located inwardly from the perimeter of the seating area,

(b) a plurality of perimeter compression springs mounted one within each of said perimeter passages and a plurality of inboard compressions springs mounted one within each inboard passage,

(c) a resiliently flexible retainer member extending about the perimeter of said seating area, along one of said seating faces, said retaining member being secured to and held fast and taut with respect to one end of each perimeter spring which is located in each perimeter passage whereby upon the removal of a seating load, the retaining member will restore the perimeter compression springs to the perpendicular position, said resiliently flexible retainer member being free of attachment to the inboard springs whereby the inboard springs are independently compressible, and,

(d) a pair of facing panels, on said facing panels being disposed in a face-to-face relationship with respect to each seating face of said main body panel.

4,429,428

FLUID EJECTED AND RETRACTED TUBE CLEARANCE TESTER

Steven G. Van Dyk, 45-631 Kapunahala Rd., Kaneohe, Hi. 97644

Filed Oct. 26, 1981, Ser. No. 314,806

Int. Cl.³ B08B *9/02*

U.S. Cl. 15—3.52 **7 Claims**

1. A tube blockage tester or blockage eliminator comprising:

a manifold having a forward end and a rearward end;

a nozzle at each end of the manifold, one of the nozzles being directed forwardly and the other nozzle being directed rearwardly;

the manifold being adapted to receive a fluid pressure supply line;

valve means mounted in the manifold for selectively controlling pressurized fluid to the nozzles;

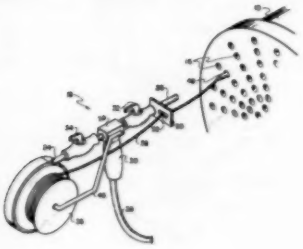
a reel with a line reeled thereon, said reel having vanes;

means mounting the reel on the manifold aft of the manifold with the vanes of the reel in the path of the rearward nozzle so that when fluid is ejected from the rearward nozzle the reel will wind the line thereon;

a probe which is capable of slipping into the tube; and the line being connected to the probe; and

a resilient hose connected to the forward nozzle, said hose

being capable of sliding into said tube after the probe is inserted therein so that the line can be projected into or withdrawn from the tube past said resilient hose when fluid is ejected into the tube or ejected onto the vanes of the reel, respectively;



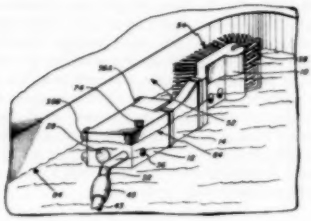
whereby, upon connecting the fluid pressure line to the manifold, the forward nozzle can be operated by the valve means to force the probe through the tube and the rearward nozzle can be operated to retract the probe by winding the line on the reel.

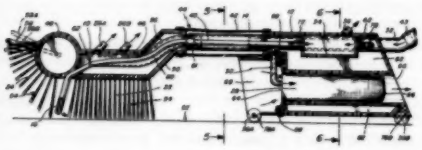
4,429,429

DEVICE FOR CLEANING SWIMMING POOL SIDEWALL

Rod H. Altschul, 53 Countryside Rd., Newton Centre, Mass. 02159

Filed Aug. 12, 1981, Ser. No. 292,159
Int. Cl.³ E04H *3/20*
U.S. Cl. 15—50 R **33 Claims**





1. A device for cleaning the sidewall of a swimming pool in the region of the waterline comprising:

cleaning means for removing dirt from the waterline region of the sidewall of the pool, said waterline region including at least a portion of the sidewall which is above the waterline;

flotation means for providing sufficient positive buoyancy to maintain said cleaning means at said waterline region of the pool;

propulsion means for advancing the cleaning means horizontally along the water surface and along the sidewall of the pool at the waterline, thereby to clean the sidewall at said waterline region;

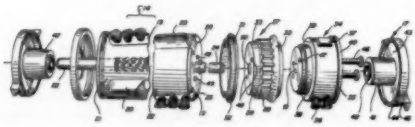
said cleaning means further comprising scrubbing means adapted to engage the pool sidewall in wiping contact and to clean the pool sidewall in response to advancement of the device along the sidewall.

4,429,430

VACUUM CLEANER BEATER BRUSH STRUCTURE

John B. Lyman, Bloomington, Minn., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Jan. 11, 1982, Ser. No. 338,665
Int. Cl.³ A46B *7/10*
U.S. Cl. 15—182 **28 Claims**



22. A vacuum cleaner beater brush structure comprising:

a dowel carrying a beater brush;

a sprocket having teeth adapted to be driven by a cog belt;

a carrier provided with brush tufts;

means for securing the carrier to one end of the dowel with said sprocket retained therebetween;

an axle extending from said dowel through said secured sprocket and into said carrier; and

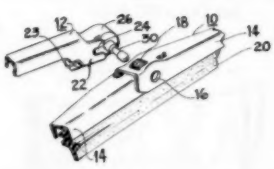
bearing means journaling the axle within said carrier.

4,429,431

WINDSHIELD WIPER ARM TO BLADE CONNECTOR

Bronislaus S. Graczyk, Buffalo, N.Y., assignor to Trico Products Corporation, Buffalo, N.Y.

Filed Nov. 12, 1981, Ser. No. 320,461
Int. Cl.³ B60S *1/40*
U.S. Cl. 15—250.32 **9 Claims**

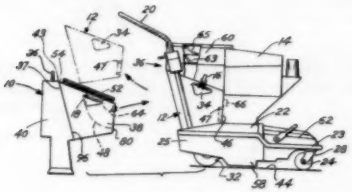


1. An adaptor for detachably coupling a windshield wiper arm to a windshield wiper blade of the type having a transverse opening for receiving a cantilever pivot pin mounted on the arm tip to the end of a windshield wiper arm of the type which includes an arm tip including a web portion having spaced depending ears, said spaced depending ears having at least one open ended slot adapted to receive a transverse pin laterally spanning the central portion of the wiper blade; said adaptor comprising a unitary body having opposite parallel external side faces of a width to fit snugly between the spaced depending ears of the arm, said unitary body having a generally flat top surface, said parallel side faces including elevated portions engageable with said slots to firmly fix the adaptor body in position between the depending ears, said elevated surfaces forming recesses complementary to the shape of an engageable in nested relationship with said depending ears, said body including a nose portion having a cantilever pin projecting substantially perpendicular to the side faces and insertable and retainable in a transverse opening of a wiper blade.

4,429,432
SANITIZER ATTACHMENT FOR A MOBILE FLOOR CLEANER

William M. Copeland, Hoffman Estates; Roland A. Blomgren, Glen Ellyn, and Robert L. Shallenberg, Wheaton, all of Ill., assignors to ServiceMaster Industries, Inc., Downers Grove, Ill.

Filed May 26, 1981, Ser. No. 266,798
Int. Cl.³ A47L 9/00
U.S. Cl. 15—320 10 Claims



10. In an improved mobile floor cleaner of the type that has a forward and a rearward end and that includes (i) a vacuum cleaner for delivering debris gathered from a floor-like surface to an air stream, (ii) at least one cleaner filter, and (iii) a rearwardly extending handle for guiding the floor cleaner, the improvement comprising, in combination:

(a) a spray nozzle rigidly mounted on the floor cleaner below the handle and directed downwardly toward the floor behind the floor cleaner, the spray nozzle providing means for combining fluid and gas and generating a fluid and gas spray;

(b) a fluid reservoir mounted in the housing and including a receptacle for the receipt of pressurized gas;

(c) a fluid line connecting the fluid reservoir to the spray nozzle;

(d) a housing having an upper end nearest the handle and a lower end adjacent the floor, the housing being rigidly secured to the rearward end of the floor cleaner, surrounding the spray nozzle, and terminating at the lower end in a shroud including a flexible skirt abutting the floor, the shroud providing means for confining the spray from the spray nozzle to a predetermined portion of the floor behind and substantially in the path of the floor cleaner as the floor cleaner advances;

(e) a pressurized gas source including means for supplying pressurized gas, a central connector, a supply line for delivering gas from the supply means to the central connector, a first conduit for delivering gas from the central connector to the spray nozzle, a second conduit for delivering gas from the central connector to the fluid reservoir, and a pressure regulator for regulating the pressure of the gas delivered by the second conduit to the reservoir;

gas control means for increasing or decreasing the pressure of the gas delivered to the spray nozzle by the first conduit;

liquid valve control means for starting the fluid and gas spraying action of the spray nozzle when the pressure of the gas delivered by the first conduit rises above a predetermined value and stopping the spraying action when the pressure drops below a predetermined value;

an attachment filter attached to the housing;

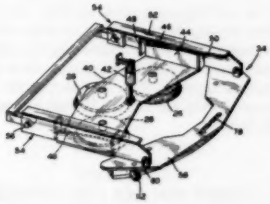
first receiving means for receiving the air stream from the vacuum cleaner and delivering the air stream to the attachment filter; and

second receiving means for receiving the air stream from the attachment filter and delivering the air stream to the cleaner filter.

4,429,433
SURFACE CLEANING MACHINE WITH SQUEEGEE ASSEMBLY

Jack L. Burgoon, Toledo, Ohio, assignor to The Scott & Fetzer Company, Lakewood, Ohio

Filed Aug. 27, 1982, Ser. No. 412,101
Int. Cl.³ A47L 11/16, 11/202
U.S. Cl. 15—320 20 Claims

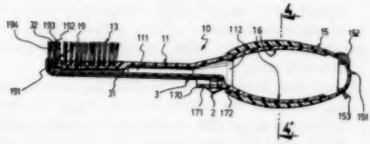


1. A surface cleaning machine comprising a frame, wheel means for supporting said frame above the surface, a cleaning solution tank carried by said frame, a recovery tank carried by said frame, a plurality of scrubbing disc brushes for scrubbing the surface with cleaning solution from said cleaning solution tank, mounting means for said disc brushes, a squeegee assembly located behind said disc brushes for collecting cleaning solution deposited on the surface, exhaust means communicating with said squeegee assembly and with said recovery tank for supplying solution from said squeegee assembly to said recovery tank, lifting means for substantially simultaneously raising and lowering said disc brushes and said squeegee assembly, said squeegee assembly having a squeegee supporting member connected to said lifting means, said squeegee supporting member having a downwardly-extending wall, a front squeegee blade adjacent said wall, a rear squeegee blade, spacing means between said front and rear squeegee blades, clamping band means extending along the rear squeegee blade on the side opposite said spacing means, and means engagable with at least an end portion of said clamping band means for moving said clamping band means lengthwise and toward said downwardly-extending wall to hold said front and rear squeegee blades in position relative to said wall and said supporting member.

4,429,434
TOOTHBRUSH

Peng Sung-shan, P.O. Box 19-252, Taipei, Taiwan

Filed Jan. 27, 1982, Ser. No. 343,096
Int. Cl.³ A47L 5/02
U.S. Cl. 15—341 4 Claims



1. A novel toothbrush comprising: a row of gum-massaging plastic bars on each one of two sides of a brush bristle section seat; a suction and fluid jet pipe at the front end of said bristle section seat, an enclosed fluid channel at the center of said toothbrush handle body, the said suction and jet pipe being connected to said fluid channel, said channel leading to the distal end of said toothbrush handle body; a squeeze bulb connected to the said distal end, and a partially closed channel

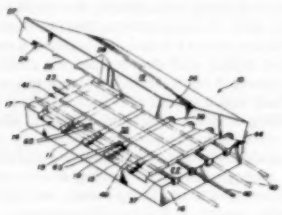
on the back of said handle body for enclosing a tooth-picking flexible member controlled by a slidable push button; said partially closed channel leading to an aperture at one side of the said suction and jet pipe; the operation of said toothbrush being characterized by massaging the gums with the two rows of plastic bars, by removing the food residues caught in the gaps between teeth with the suction fluid and jet forces generated by pressing the squeeze bulb applied to the said gaps while the nozzle of said suction and fluid jet pipe is contacting the said gaps, by making the tooth-brushing action more comfortable without hurting or bloodying the gums with the said bars, and by picking out the food residues tightly caught at the gaps between teeth with a pointed end of said tooth-picking member which is extended out by means of sliding the push button, in addition to achieving normal tooth-brushing purposes with the toothbrush bristles.

4,429,435

HEAT STRIP HOLDER FOR SKEWER STICKS

James F. Walls, Box 181, Smyrna, Tenn. 37167

Filed Jan. 26, 1982, Ser. No. 343,018
Int. Cl.³ A47J *43/28*
U.S. Cl. 17—1 S **10 Claims**



1. A meat holder for supporting elongated strips of meat for skewering with elongated skewer sticks, comprising:

(a) a base including an elongated lower cavity having a bottom surface, and an end wall, and adapted to receive lengthwise at least one elongated meat strip,

(b) an elongated cover member having a bottom face and opposite end portions, an upper cavity opening through said bottom face, said cover member being adapted to engage said base in closed position to register said upper and lower cavities in opposing, coextensive relationship, for receiving lengthwise therebetween at least one elongated meat strip,

(c) a plurality of longitudinally spaced, transversely extending, lower ribs in said lower cavity, said lower ribs projecting toward said cover member in closed position.

(d) a plurality of longitudinally spaced, transversely extending, upper ribs in said upper cavity projecting toward, spaced from, and opposing said corresponding lower ribs, in said closed position of said cover member,

(e) at least one stick hole extending longitudinally through said end wall,

(f) said stick hole having a longitudinal skewer axis extending between the corresponding opposed, spaced apart lower and upper ribs, so that in the closed position of said cover member, said upper ribs terminate above said skewer axis and said lower ribs terminate below said skewer axis,

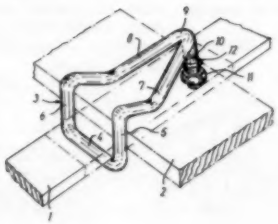
(g) said stick hole being adapted to receive an elongated skewer stick therethrough and to guide said skewer stick substantially coaxially of said skewer axis and between said corresponding upper and lower ribs for longitudinal penetration of a substantially straight elongated strip of meat held lengthwise between said upper and lower ribs, so that said stick is substantially confined within the penetrated strip of meat.

4,429,436

ANGULAR HOLDER FOR CLAMPING A HARROW TINE TO A SUPPORTING ROD

Finn U. H. Jensen, Vemmelev, Denmark, assignor to Kongskilde Koncernselskab A/S, Soro, Denmark

Filed Feb. 5, 1982, Ser. No. 346,270
Claims priority, application Denmark, Feb. 19, 1981, 740/81
Int. Cl.³ A44B *21/00*
U.S. Cl. 24—3 D **4 Claims**



1. In a clamping holder for clamping a tine shaft (1) to a supporting rod (2) extending transversely to the tine shaft (1) wherein a hole (12) is located in the tine shaft (1) adjacent a first lateral edge of the supporting rod (2), the combination comprising

first leg means including a generally horizontal bottom member (4) adapted to engage the tine shaft (1) and a pair of generally vertical, parallel branch members (5 and 6) adapted to engage a second lateral edge of the supporting rod (2),

said branch members (5 and 6) extending from opposite ends of said bottom member (4) to define a generally U-shaped element,

second leg means including a pair of extensions (7 and 8) extending from the branch members (5 and 6), respectively, in parallel relation to the tine shaft (1),

said extensions (7 and 8) converging toward each other and being joined together at a converged joint (9) remote from said branch members (5 and 6),

a generally vertical threaded bolt (10) integrally joined to the converged joint (9) and adapted to extend across the first lateral edge of the supporting rod (2),

said threaded bolt (10) adapted to extend through the hole (12) in the tine shaft (1),

a nut (11) being tightened on said threaded bolt (10) against the tine shaft (1), and

said threaded bolt (10) being initially inclined so as to be pressed against the first lateral edge of the supporting rod (2) upon tightening of said nut (11).

4,429,437

ASSEMBLAGES OF FASTENERS

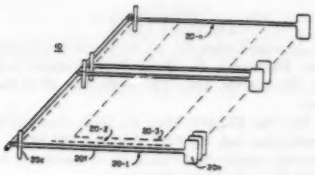
Joseph R. Paradis, Holden, Mass., assignor to Dennison Manufacturing Company, Framingham, Mass.

Division of Ser. No. 109,578, Jan. 4, 1980, Pat. No. 4,304,743.
This application Nov. 16, 1981, Ser. No. 321,987
The portion of the term of this patent subsequent to Jan. 15, 1997, has been disclaimed.
Int. Cl.³ A44B *9/00*; B29C *17/02*
U.S. Cl. 24—150 FP **12 Claims**

1. A product produced in accordance with a method of manufacturing an assemblage of fasteners, comprising the steps of

(a) molding the assemblage as a set of connected individual

fasteners, each including an end member which is joined by a filament, and



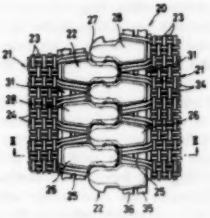
(b) stretching the individual fasteners simultaneously while subjecting them to controlled heating directed along their filaments from an external source.

4,429,438

SLIDE FASTENER STRINGER

Kiyoshi Takeshima, Namerikawa, and Yoshinori Masuda, Kurobe, both of Japan, assignors to Yoshida Kogyo K. K., Tokyo, Japan

Filed Jul. 27, 1981, Ser. No. 287,131
Claims priority, application Japan, Aug. 1, 1980, 55-106615
Int. Cl.³ A44B *19/00*
U.S. Cl. 24—401 **5 Claims**



1. A slide fastener stringer comprising:

(a) a continuous coupling element molded of a single material and having a plurality of laterally spaced scoops, each of said scoops including a coupling head and a pair of first and second legs extending from said coupling head in a common direction and contacting each other at respective distal ends thereof, each of said legs having a portion reduced in width progressively in a direction from said coupling head leading to said distal end;

(b) said element further having a series of first connecting portions and a series of second series portions, each of said first connecting portions extending in between two adjacent ones of said first legs, each of said second connecting portions extending between two adjacent ones of said second legs, said first connecting portions being staggered relative to said second connecting portions, each of said connecting portions being fully interrupted only between every second pair of said legs, and

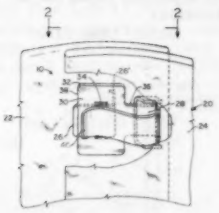
(c) a woven stringer tape formed with a plurality of warp threads and a weft thread, said weft thread having a plurality of loops disposed along the longitudinal edge of said stringer tape and extending around alternate ones of said first and second connecting portions, thereby securing said coupling element to said longitudinal tape edge.

4,429,439

GARMENT EXPANDER

Edward F. Waugh, 8508 Harris Ave., Baltimore, Md. 21234

Filed Jan. 17, 1983, Ser. No. 458,474
Int. Cl.³ A44B *13/00*
U.S. Cl. 24—573 **6 Claims**



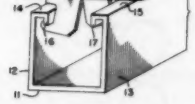
1. In a system for extending waistband fastening of trousers, the improvement comprising: said trousers being of the type having at the waistband fly opening a hook protruding inwardly from the inner surface of a lefthand flap and an eye protruding outwardly from the outer surface of a righthand flap for engaging the hook to hold the right hand and left hand flaps together, when hooked; means for connecting said hook and eye when said hook and eye are not engaged to each other and are at a distance from each other caused by waistband extension, including: the means for connecting being a unitary member of sheet material, a first portion of said unitary member forming a bridge for engaging said hook, and a second portion of said unitary member forming a loop for engaging said eye within said loop.

4,429,440

STRUT CLIP

Raymond S. Laughlin, Cuyahoga Falls, and Edward J. Lynch, Jr., Akron, both of Ohio, assignors to Erico Products, Inc., Cleveland, Ohio

Filed Apr. 19, 1982, Ser. No. 369,463
Int. Cl.³ F16L *3/10*
U.S. Cl. 24—486 **14 Claims**

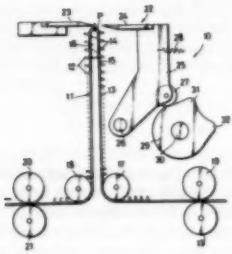


1. A clip comprising a metal strip of uniform width throughout its length, an aperture adapted to hold a fastener in the center of said strip, the ends of said strip being bent in the same direction along parallel lines extending at an acute angle to the length of the strip and symmetrical with the aperture to form legs extending angularly oppositely and symmetrically but generally parallel with respect to the axis of the aperture, and notch means in each lateral edge diagonally opposite each other whereby the clip may be engaged against a structural element and the like to support a conduit or the like thereagainst.

4,429,441
METHOD AND APPARATUS FOR MANUFACTURING A HOOKED FASTENER PART FOR HOOK-AND-LOOP FASTENERS

Hissai Nishiyama, Hayahoshi, and Takao Kanada, Kurobe, both of Japan, assignors to Yoshida Kogyo K. K., Tokyo, Japan

Filed Dec. 24, 1981, Ser. No. 334,253
Claims priority, application Japan, Dec. 29, 1980, 55-186254; Dec. 29, 1980, 55-186255
Int. Cl.³ D06C *13/08*
U.S. Cl. 26—9 15 Claims



1. A method of manufacturing a hooked fastener part for hook-and-loop fasteners, comprising the steps of:

(a) feeding a continuous base of sheet material, having a number of successive rows of laterally spaced loops projecting from one surface of the base, in a longitudinal direction along an arcuate path with said loops directed away from the center of said arcuate path;

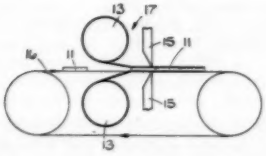
(b) introducing said rows of loops, successively into a given reciprocating path of a cooperating pair of cutting members relatively movable toward and away from each other along said reciprocating path; and

(c) cutting each loop of one of said rows on one of its legs at two different points by reciprocating said cutting members two times while said one row of loops is in said reciprocating path of said cutting members along said arcuate path.

4,429,442
METHOD OF PRODUCING A LEAD-ACID BATTERY UTILIZING VIBRATIONAL ENERGY

Brian J. Thomas, Shirley, England, assignor to Lucas Industries Limited, Birmingham, England

Filed Sep. 30, 1980, Ser. No. 192,274
Claims priority, application United Kingdom, Oct. 2, 1979, 7934142
Int. Cl.³ B23P *13/00*
U.S. Cl. 29—2 8 Claims



1. A method of producing a lead-acid battery plate including a carrier supporting a paste containing oxides of lead, comprising the steps of:

(a) supplying the paste to the carrier,

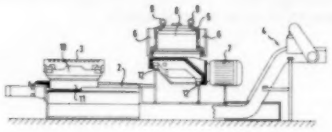
(b) contacting (an exposed surface) of the paste on the carrier with a layer of fibrous material, and

(c) supplying vibrational energy to the fibrous layer so as to cause the paste to impregnate the fibrous layer and thereby secure the fibrous layer to the plate.

4,429,443
MACHINE TOOL

Rolf Kölblin, Martin-Luther-Str. 12, Mosbach-Neckarelz; Wolfgang Keller, Flurstrasse 16, Mosbach-Diedesheim, and Erich Wittmann, Gördelerstr. 136, 7100 Heilbronn, all of Fed. Rep. of Germany

Division of Ser. No. 132,441, Mar. 21, 1980, abandoned. This application Jul. 12, 1982, Ser. No. 397,397
Claims priority, application Fed. Rep. of Germany, Aug. 24, 1979, 2934395; Dec. 18, 1979, 2950934
Int. Cl.³ B23B *39/20*
U.S. Cl. 29—26 A 15 Claims



1. A machine tool comprising:

support means for a workpiece;

a machine turret having a tool carrier unit with a plurality of spaced apart mounts for carrying a plurality of tools, including at least one driven tool, associated with a machining sequence, said tool carrier unit being indexable to a plurality of stations to bring each of said plurality of mounts in turn to a working station, said machine turret further comprising:

a base unit with a first face-toothed index ring;

a second face-toothed index ring on said tool carrier unit, said tool carrier unit being engageable with said base unit and said second face-toothed index ring being complementary to and engageable with said first face-toothed index ring;

clamping means movable relative to said base unit between a first position in which said first and second face-toothed index rings are firmly clamped one against the other and a second position in which said first and second face-toothed index rings are free of one another;

bearing means between said tool carrier unit and said base unit to permit relative rotary indexing therebetween when said carrier unit is in said second position;

a tool drive within said base unit and coupling means for releasably coupling said tool drive to a driven tool positioned at said working station; drive means comprising a pinion gear journalled in said base unit and an annular ring gear attached to said tool carrier unit for rotating said tool carrier unit relative to said base unit when in said second position to index said tool carrier unit to each of said plurality of stations in accordance with said machining sequence;

quick release connections means for releasably attaching said carrier unit to said clamping means thereby enabling said carrier unit together with any tools mounted thereon to be rapidly exchanged; and

means for producing relative movement between said support means and said machine turret to effect machining of a workpiece supported by said support means; wherein said bearing means comprises a ball bearing having first and second races, wherein said clamping means comprises a central support column axially movable relative to said base unit and having an upper end carrying one of said first and second races, wherein the other of said first and second races is connected to said tool carrier unit via said quick release connection means, and wherein said ring gear is provided on the race connected to said tool carrier unit.

4,429,444

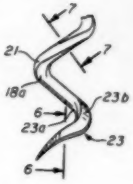
CORK EXTRACTOR

Herbert Allen, Houston, Tex., assignor to Hallen Company, Houston, Tex.

Division of Ser. No. 17,598, Mar. 5, 1979, Pat. No. 4,291,597, which is a continuation-in-part of Ser. No. 925,365, Jul. 17, 1978, Pat. No. 4,276,789. This application Mar. 19, 1981, Ser. No. 245,584

Int. Cl.³ B23P *13/00*

U.S. Cl. 29—33 F **5 Claims**



1. A method of forming a corkscrew comprising:
a. forming a helix from a wire;
b. removing material from one end portion of said wire to form a pointed tip portion, said material being removed from surfaces of said tip portion which are generally upwardly facing when said helix is disposed vertically with said tip portion lowermost; and
c. leaving the downwardly facing surfaces of said tip portion substantially on lead with the downwardly facing surfaces of said helix.

4,429,445

MACHINE FOR REMOVING BURRS FROM PIPE

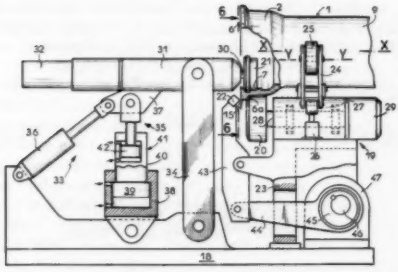
Claude B. Fuminier, Pont-a-Mousson, France, assignor to Pont-a-Mousson S.A., Nancy, France

Filed May 18, 1981, Ser. No. 264,330

Claims priority, application France, May 30, 1980, 80 12054

Int. Cl.³ B23P *23/04;* **B21D** *19/04*

U.S. Cl. 29—33 T **11 Claims**



1. A machine for removing burrs from or trimming sockets of cast-iron pipes, comprising: a machine frame (**18**), means for supporting a pipe (**1**) above said frame and for rotating the pipe about its longitudinal axis, two pressing rollers (**20, 21**) having profiles which individually follow the respective inner and outer profiles of a region of the socket (**2**) to be trimmed, and displacement means for radially clamping the two rollers against opposite sides of the region of the socket to be trimmed and for subsequently releasing the rollers from the socket, an outer one (**20**) of said rollers being fixedly mounted to said machine frame and comprising part of said supporting means, said displacement means including a pivoted quadrilateral structure, means mounting an inner one (**21**) of said rollers on a first side of said structure, second and third sides of said structure adjacent said one side comprising, respectively, a link member (**34**) and a force-calibrating hydraulic jack (**41**), and a diagonally oriented jack (**36**) pivotally disposed between said machine frame and an intersection point of said first and third structure sides.

4,429,446

ROLL FOR A ROLLING MILL

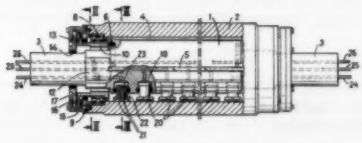
Rolf Lehmann, Rudolfstetten, Switzerland, assignor to Escher Wyss Aktiengesellschaft, Zurich, Switzerland

Filed Apr. 5, 1982, Ser. No. 365,365

Claims priority, application Switzerland, May 6, 1981, 2943/81

Int. Cl.³ B21B *29/00*

U.S. Cl. 29—116 AD **3 Claims**



1. A roll for a rolling mill comprising:
a stationary roll support;
a substantially tubular-shaped roll shell mounted for rotation about said stationary roll support;
said rotatable tubular-shaped roll shell and said stationary roll support cooperating with one another so as to define therebetween a hydrostatic pressure chamber;
means operatively associated with said roll support for sealing said pressure chamber;
pressurized fluid medium source means communicating with said pressure chamber for infeeding a pressurized fluid medium to said pressure chamber;
substantially punch-like support elements provided between the stationary roll support and said rotatable roll shell and located essentially in a plane of symmetry of said pressure chamber;
means operatively associated with said roll support defining at least one source of pressurized fluid medium for infeeding a pressurized fluid medium to said punch-like support elements;
said punch-like support elements being arranged at a side of said stationary roll support which faces away from said pressure chamber; and
said pressure chamber being located on the side of said seal means opposite said punch-like support elements.

4,429,447

BEARING CUP INSTALLING TOOL

Marvin A. Davis, Faribault, Minn., assignor to Owatonna Tool Company, Owatonna, Minn.

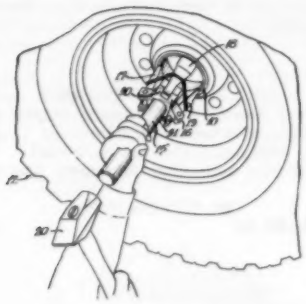
Filed Aug. 16, 1982, Ser. No. 408,152

Int. Cl.³ B25B *27/14*

U.S. Cl. 29—275 **6 Claims**

1. A tapered bearing cup installing tool comprising, a cross head, a driving handle connected to said cross head and extending from one side thereof, said handle and cross head having abutting force-transmitting surfaces, a tubular adjusting screw threaded into the cross head and extending outwardly from the side thereof opposite said driving handle, at least three jaws pivotally mounted on said cross head and extending from the same side of the cross head as the adjusting screw and disposed in a circular array with the adjusting screw at the center, spring means engaging said jaws and urging the jaws toward said adjusting screw, each of said jaws having a bearing cup engaging notch at a free end thereof, a disc on the adjusting screw and inclined surfaces on the inner faces of the jaws whereby movement of the adjusting screw lengthwise of the

cross head pivots the jaws against the action of the spring means and varies the effective diameter defined by the bearing



cup engaging notches, and means operable internally of the tubular adjusting screw for locking the adjusting screw in adjusted position.

4,429,448

MOUNTING DEVICE FOR A BICYCLE HUB

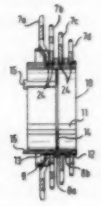
Hans Butz, Schwebheim, Fed. Rep. of Germany, assignor to Fichtel & Sachs AG, Schweinfurt, Fed. Rep. of Germany

Filed Nov. 16, 1981, Ser. No. 321,524

Claims priority, application Fed. Rep. of Germany, Nov. 28, 1980, 8031759[U]

Int. Cl.³ B25B *27/14*

U.S. Cl. 29—281.5 **22 Claims**



1. A mounting device for use in mounting a plurality of annular members such as chain wheels onto a driving member of a drive hub of a bicycle and the like, comprising an axially extending mounting sleeve having a first axial end, a second axial end and an outer and an inner circumferentially extending peripheral face located between said first and second ends, means arranged on said mounting sleeve for effecting centering of said sleeve relative to a drive hub and means for effecting angular positioning of annular members on said sleeve and means for alignment corresponding to a torque transmitting profile on the drive hub, first axial abutment means provided on said outer peripheral face at said mounting sleeve adjacent the first axial end of said mounting sleeve and a second axial abutment means provided on said outer peripheral face of said mounting sleeve adjacent the second axial end of said mounting sleeve, said first abutment means being deflectable so that members temporarily pre-assembled on said outer peripheral face of said mounting sleeve between said first and second abutment means may be axially slid over said first abutment means onto a drive hub when said means for centering align said mounting sleeve relative to the drive hub.

4,429,449

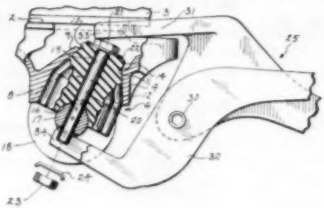
ASSEMBLY AND DISASSEMBLY OF ROLLER SKATE COMPONENTS

Edward Balstad, P.O. Box 90, Cambridge, Wis. 53523

Filed Jul. 13, 1981, Ser. No. 282,375

Int. Cl.³ B23P *11/02, 19/00*

U.S. Cl. 29—446 **1 Claim**



1. A method of securing a roller skate axle and foot plate together wherein the axle is transversely seated across the outer end portion of a resilient cushion block which extends axially into a socket formed in the foot plate, and wherein a threaded bolt extends axially through the cushion block and with the free end portion of the bolt remote from the bolt head extending through the tranverse central portion of said axle, the steps comprising:

(a) applying a squeezing force between said bolt head and the portions of said axle on either side of said bolt to compress said cushion block against said socket and deform the outer end portion of said block axially inwardly along said bolt,

(b) freely threading a nut onto the said free end portion of said bolt until said nut is adjacent said axle,

(c) and then releasing said squeezing force so that the outer end portion of said cushion block springs axially outwardly along said bolt to a partially deformed state so that said block causes said seated axle to biasingly bind said nut to said bolt.

4,429,450

METHOD OF MAKING STRUCTURAL BEARINGS

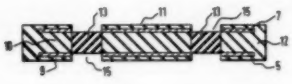
William E. Reeve, Hemingford Grey, England, assignor to Dixon International Limited, Cambridge, England

Filed Aug. 24, 1982, Ser. No. 410,948

Claims priority, application United Kingdom, Aug. 26, 1981, 8126010

Int. Cl.³ B23P *11/02*

U.S. Cl. 29—451 **5 Claims**



1. A method of manufacturing a modular element for a bridge bearing or other structural bearing comprising: providing a press having relatively movable upper and lower members, the lower member having one or more upstanding posts or pins; positioning on the lower member, successively, one or more rubber sheets, a lower metal plate, one or more rubber sheets, an upper metal plate and one or more rubber sheets, the one or more posts or pins extending through holes in the metal plates and the rubber sheets and locating the metal plates to prevent lateral movement thereof; operating the press to move the upper and lower members together and to subject the rubber sheets to pressure and subjecting the rubber sheets to heat to effect vulcanization of the rubber and to bond the rubber to the metal plates whereby an intermediate layer of

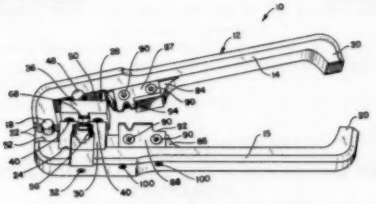
rubber is formed between the two metal plates and upper and lower layers of rubber are formed respectively above and below the upper and lower plates, the rubber deforming around and bonding to the edges of the metal plates, whereby the plates become completely encased in rubber; removing the resulting modular element from the press; and inserting a vulcanized rubber plug into the or each of the holes left by the one or more posts or pins and retaining said plug therein.

4,429,451

HAND TOOL FOR APPLYING ELECTRICAL CONNECTORS

Henry R. Angelico, 355 Fairwood Rd., Bethany, Conn. 06525

Filed Jan. 16, 1981, Ser. No. 225,855
Int. Cl.³ H01R *43/04*
U.S. Cl. 29—566.4 **11 Claims**



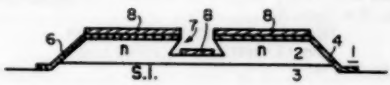
1. A telephone plug hand tool for securing a telephone connector plug to a multiple lead telephone line, comprising a handle with a pair of opposed handle members having a pivot connection at a forward end thereof and hand operable toward each other for closing the handle, a unitary preassembled jaw module assembly detachably secured to the handle between said handle members just rearwardly of said pivot connection, said module being adapted for movement into and out of an open position for receiving a telephone connector plug and being adapted to be maintained in its preassembled condition during said movement into and out of said open position, said module including a telephone connector plug support jaw and an aligned connector setting jaw operatively associated for relative linear movement toward and away from said open position, jaw mounting means for mounting the jaws for relative linear movement thereof for opening and closing the jaw module and for detachably securing one of the jaws to one of the handle members, and biasing means for biasing the jaws apart as the handle members move apart, the support jaw having a contoured telephone plug connector locating pocket to locate and support a multiple lead telephone plug connector of established design in operative alignment with the connector setting jaw and the connector setting jaw being contoured for setting a said telephone plug connector mounted within the pocket of the support jaw to a multiple lead telephone cord upon closure of the jaw module, the other handle member having an actuator for sliding engagement with the other jaw for drivably closing the jaw module against the bias of the biasing means when the handle is closed.

4,429,452

METHOD OF MANUFACTURING FIELD-EFFECT TRANSISTORS WITH SELF-ALIGNED GRID AND TRANSISTORS THUS OBTAINED

Didier Meignant, Emerainville, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 4, 1981, Ser. No. 327,374
Claims priority, application France, Dec. 24, 1980, 80 27423
Int. Cl.³ H01L *21/28, 21/308*
U.S. Cl. 29—571 **17 Claims**



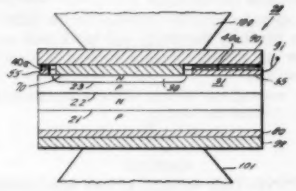
7. A method according to claim 6, wherein said third metal layer is formed of titanium, platinum, and gold deposited in order.

4,429,453

PROCESS FOR ANODIZING SURFACE OF GATE CONTACT OF CONTROLLED RECTIFIER HAVING INTERDIGITATED GATE AND EMITTER CONTACTS

James H. Hauck, Hermosa Beach; Anders Nilarp, and Thomas J. Roach, both of Rancho Palos Verdes, all of Calif., assignors to International Rectifier Corporation, Los Angeles, Calif.

Filed Apr. 6, 1981, Ser. No. 251,267
Int. Cl.³ H01L *21/283*
U.S. Cl. 29—591 **6 Claims**



1. The process of manufacture of a high power semiconductor device comprising the steps of:

forming an interdigitated emitter region and gate region which terminate adjacent opposite sides of an elongated junction extending over one surface of a semiconductor wafer;

forming a first metal layer atop the full area of said one surface;

anodizing the upper surface of said first metal layer;

removing said first metal layer from a thin elongated region spanning across said junction at said one surface to define separate emitter and gate region contacts;

forming a photoresist mask over the portion of said one surface exposed by the removal of said thin elongated region of metal removed from said first metal layer and over the portions of said first metal layer atop said gate region;

removing the anodizing from the portions of said first metal layer which are exposed by said photoresist mask;

forming a second metal layer atop the full area of said first metal layer and atop said photoresist mask;

sintering said second metal layer into said first metal layer to define an emitter contact of thickness equal to the combined thickness of said first and second metal layers; and decomposing said photoresist mask during said sintering step;

removing the region of said second metal layer from atop said photoresist mask to define a gate contact having a thickness defined by the thickness of said first layer and covered by said anodized layer;

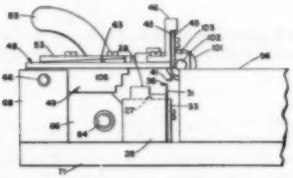
and applying the flat surface of a rigid conductive expansion plate electrode to the upper exposed surface of said second metal layer, with said flat surface physically spaced from the upper surface of said anodized layer on said gate contact.

4,429,454

CONNECTOR TERMINAL SPREADER

Alfred P. Broyer, Hopatcong, N.J., and David R. Dines, Oklahoma City, Okla., assignors to Western Electric Company, Inc., New York, N.Y.

Filed Mar. 29, 1982, Ser. No. 362,948
Int. Cl.³ H01R *43/00*; H05K *3/36*
U.S. Cl. 29—747 **13 Claims**



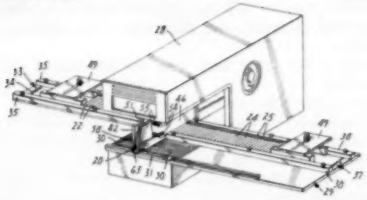
1. A connector terminal spreader, which comprises:
a nest for supporting a connector;
a first fixed spreader meaber extending toward the nest;
a block;
a slide mounted on the block;
a second spreader member mounted on the slide;
means for pivotally mounting said block and said slide to position said second spreader member in alignment with said nest; and
means for moving said slide to advance said second spreader member toward the nest.

4,429,455

CONNECTOR APPLICATION MACHINE

David C. Roeker, Hudson, Wis., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Feb. 3, 1982, Ser. No. 345,334
Int. Cl.³ H01R *43/04*
U.S. Cl. 29—749 **5 Claims**



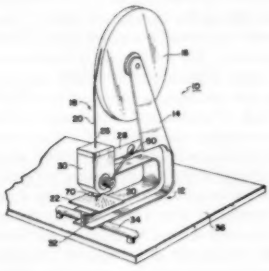
1. A machine for applying two part electrical connectors having insulation displacement contact elements to multiconductor flat cables, comprising:
a central application station having a multiconductor flat cable path with means for locating a multiconductor flat cable widthwise to position the conductors thereof at predetermined positions,
a body magazine extending to one side of said application station for holding a multiplicity of connector bodies,
a cover magazine extending to the opposite side of said application station for holding a multiplicity of connector covers,
said body and cover magazines being in side-to-side alignment and lying behind said multiconductor flat cable path with one magazine above and one below the plane of said flat cable path at said application station,
a pre-application station between said body magazine and said cover magazine and in front-to-back alignment with said application station,
means for urging connector bodies and connector covers in said magazines seriatim into said pre-application station,
support and guide means extending from said pre-application station to said application station for supporting and guiding a body and a cover from said pre-application station to said application station; said support and guide means including a pair of spaced plates, one of which has its lower edge turned inward through an acute angle toward the opposing plate to define an inclined edge for supporting and guiding the upper connector part from said pre-application station to said application station, said plates being spaced to support the upper connector part between them on said inclined edge and being resiliently movable apart to permit the upper connector part to be pushed past said inclined edge, and
means at said application station extending between said connector guide and support plates for pushing an upper connector part past said inclined support edge and for pressing a connector body and cover together with a flat cable between them to electrically connect the contact elements to the conductors of the flat cable.

4,429,456

APPARATUS FOR INSERTING ELEMENTS INTO A WORKPIECE

Irwin Zahn, 300 E. 33rd St., New York, N.Y. 10016

Filed Feb. 1, 1982, Ser. No. 344,623
Int. Cl.³ B23P *19/00*; A43D *69/12*; B27F *7/00*
U.S. Cl. 29—798 **11 Claims**



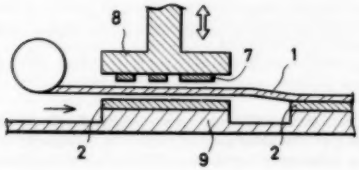
1. Apparatus for inserting elements into a workpiece; said apparatus comprising:
reciprocating feeding means movable between first and second positions for sequentially advancing a supply strip of integrally connected preformed elements toward said workpiece; and
actuating means cooperating with said reciprocating feeding means for rotating said reciprocating feeding means when said reciprocating feeding means has reached its said second position.

4,429,457

PROCESS FOR MANUFACTURING A PRINTED CIRCUIT BOARD

Yoshiyasu Noguchi, Musashino; Shoji Yokokoji, Sayama; Shozo Saito, and Kiketsu Hasegawa, both of Tokyo, all of Japan, assignors to Toppan Printing Co., Ltd., Japan

Filed Oct. 19, 1981, Ser. No. 312,820
Claims priority, application Japan, Oct. 22, 1980, 55-147853
Int. Cl.³ H05K 3/34
U.S. Cl. 29—840 17 Claims



1. A process for manufacturing a printed circuit board comprising the steps of:

coating one side of a flat supporting film with a soldering flux which can adhere to the supporting film at room temperature and which can be activated so as to be readily adhesive through the application of heat and pressure;

attaching the supporting film to a printed circuit board so as to bring the flux-coated surface of the supporting film in contact with a soldering surface of the printed circuit board;

applying heat and pressure to a non-coated surface of the supporting film so as to transfer the flux to the printed circuit board;

separating the support film from the flux coated soldering surface; and

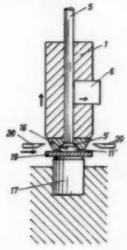
soldering electronic parts onto flux coated portions of the printed circuit board.

4,429,458

METHOD FOR MAKING COMPOSITE ELECTRICAL CONTACT WELDED IN SITU TO SUPPORTING METAL, AND APPARATUS THEREFOR

Akira Shibata, Yokohama, Japan, assignor to Chugai Denki, Kogyo K.K. of Tokyo, Japan

Filed Dec. 18, 1980, Ser. No. 217,860
Claims priority, application Japan, Dec. 29, 1979, 54-170893
Int. Cl.³ H01R 43/02
U.S. Cl. 29—879 5 Claims



1. A method of making a composite electrical contact having a metallic contact portion and a metallic base portion cold welded to the contact portion, said composite electrical contact being welded to a metal support, said method comprising,

positioning a wire of a first metallic material for the contact portion and a wire of a second metallic material for the base portion coaxially in alignment,

cold welding together the confronting ends of said wires by subjecting them to pressure between a punch and die along their axial directions thereby to form a composite contact,

positioning said composite contact onto a metal support so as to make the base portion of the contact abut against a desired site on said support immediately after said cold welding,

placing said composite contact and the metal support between a pair of charged electrodes, one of which comprises said punch, and

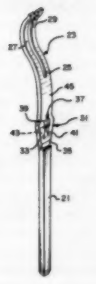
resistance welding said contact to said support while restraining the cold welded ends of said wires in a recess in one of the confronting ends of said electrodes, and in such manner that the resistance heat between the electrodes, which welds the contact to the metal support, anneals the contact and releases any stress which was produced when said confronting ends of said wires were cold welded.

4,429,459

ELECTRICAL TERMINAL WITH CAVITY COMPENSATOR

James E. Lynch, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Jun. 17, 1981, Ser. No. 274,607
Int. Cl.³ H01R 4/48
U.S. Cl. 29—881 3 Claims



1. A method of fixing a terminal of the type having an intermediate section (31) between a post (21) and a contact structure (23) and an aperture (37) in the intermediate section (31) with a lance (43) extending outwardly therefrom into a housing (51), the method comprising the steps of:

a. providing the intermediate section (31) with tapered sides (33, 35) which are resilient into and away from the aperture (37);

b. inserting the terminal into the housing (51) with the narrowest end of the intermediate section (31) entering the cavity (53) first so that the lance (43) in encountering a wall (47) of the cavity (53) can be deflected towards the aperture (37) as required by the cavity dimension; and

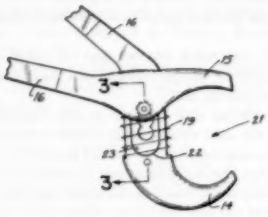
c. further inserting the terminal into the housing so that as the tapered sides (33, 35) of the intermediate section (31) encounter opposing walls (55-57) of the cavity (53), the tapered sides (33, 35) are compressed into the aperture (37) so that the aperture size is reduced and the lance (43) becomes locked against further movement towards the aperture (37).

4,429,460

ADJUSTABLE WIRE CUTTING PLIERS

Lee Hill, Box 22, Golconda, Nev. 89414, and George Spector, New York, N.Y., assignors to Lee Hill, Golconda, Nev.

Filed Jun. 14, 1982, Ser. No. 387,787
Int. Cl.³ B26B 13/14
U.S. Cl. 30—90.1 2 Claims



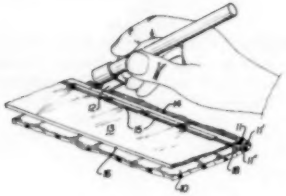
1. An adjustable wire cutting pliers, comprising in combination, a pair of crossing levers pivotally secured together by a bolt set through a hole and slot at intermediate portions thereof, a pair of jaws formed at one end of said levers, and a pair of handles formed at an opposite end, a compression coil spring around one said lever urging against the other said lever so to spread said jaws apart, and means to adjust said bolt set in said slot to either one of six pivot positions.

4,429,461

DEVICE FOR CUTTING VINYL SHEET FLOORING

Joseph J. Glavic, 3247 Potomac Dr., Brunswick, Ohio 44212

Filed May 20, 1982, Ser. No. 380,086
Int. Cl.³ B25H 7/00
U.S. Cl. 30—289 8 Claims



1. An implement for cutting grouted-tile-pattern vinyl sheet floor covering ("linoleum roll stock") longitudinally along a line in linearly continuous simulated grouting in the linoleum's surface, said implement comprising,

(a) a laminar, elongated, generally rectangular metal, combined visual gauge and guide member having a thickness in the range from about 0.020" (inch) to about 0.25" thick,

(b) a continuous marginal portion defined by an exterior edge of said member and aligned outer edges of plural longitidunally spaced apart rectangular apertures in said member, said marginal portion having a thickness corresponding to the minimum width of grouting in said tile-pattern of a first roll-portoion of said linoleum roll stock, so as to enable a boundary of said grouting to be visible within said apertures, and,

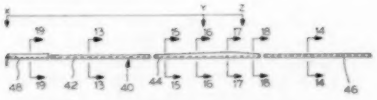
(c) manually operable blade means to be guided in contact with said exterior edge so as to cut along a line in said linearly continuous grouting, leaving a predetermined portion of said grouting, which enables said first roll-portion to be abutted to a second roll-portion of said linoleum, so as to maintain a predetermined uniform width of said continuous grouting and match the overall grouted-tile-pattern without showing the joint.

4,429,462

VARIABLE STIFFNESS RULE BLADE, RULE EMPLOYING SAME, AND METHOD OF MAKING SAME

Edward C. Rutty, Portland, and Carl C. Stoutenberg, Burlington, both of Conn., assignors to The Stanley Works, New Britain, Conn.

Filed Sep. 30, 1982, Ser. No. 430,730
Int. Cl.³ G01B 3/02
U.S. Cl. 33—138 25 Claims



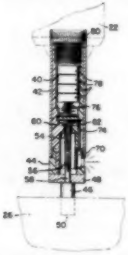
1. A coilable rule blade having greater standout length comprising an elongated strip of resiliently deflectable metal having a substantially uniform width in its coiled flattened state and, in its uncoiled state, a concavo-convex cross section along substantially its entire length with the arc opening in the direction of coiling, said blade being relatively free from stresses and relatively stable in the extended position, said cross section having a central segment of arcuate configuration defined by a radius R and having a depth H, the length of said blade being comprised of three portions, a first portion adjacent one end thereof with a depth H_1 and radius R_1, a second portion extending from said first portion with a depth H_2 and a radius R_2, and a third portion extending from said second portion to adjacent the other end thereof with a depth H_3 and a radius R_3, said second portion having a depth H_2 greater than the depth H_1 and H_3 of said first and third portions and a radius R_2 less than the radii R_1 and R_3 of said first and third portions, said second portion extending for a portion of the length of said blade which includes the normal breakpoint for a blade of said width and of a uniform cross section corresponding to the depth H_1 and radius R_1 of said first portion and which extends beyond said normal breakpoint towards said other end of said blade to provide greater standout length.

4,429,463

MACHINIST ELECTRO-MECHANICAL DYNAMIC DATUM POINT LOCATOR TOOL

Bruce R. Angell, 17216 195h Pl. N.E., Woodinville, Wash. 98072

Filed Oct. 21, 1981, Ser. No. 313,288
Int. Cl.³ G01B 5/25
U.S. Cl. 33—169 C 9 Claims



1. A machinist's electro-mechanical dynamic datum point locator tool, indicating variable to continuous appearing light signals at the circumference of the locator tool, during the tool's spring held tip's eccentric to concentric rotational workpiece contacts while rotating in the collet of a mill head of a machine tool, comprising:

(a) a small cylinder or tool barrel for placement, for example, in an adjustable chuck or collet in a mill head of a milling

machine, wherein the small cylinder is a subassembly comprising, in turn:

(i) a conductive tubular sleeve;

(ii) a hollow insulating body closely fitted within the tubular sleeve and made in two longitudinal halves which when assembled define several chambers and a disc like abutment to receive the electro-mechanical means;

(iii) a conductive externally threaded metal cap threaded down into the top of this interior insulating sleeve; and

(iv) a non conductive bottom collar having a circumferential space to receive the light emitting diode, a lower central opening to receive the depending tip assembly, and a formed top for placement into both the lower end of the conductive tubular sleeve and the hollow insulating body, following the earlier insertion of the insulating body together with the electro-mechanical means into the conductive tubular sleeve;

(b) a tip assembly flexibly supported and depending from the small cylinder for eccentric preplacement rotation, continuing less eccentric rotation, and final concentric rotation immediately adjacent an edge of a workpiece held in place on the bed of the milling machine;

(c) a light emitting diode supported in the small cylinder at its circumference to emit light from a small area of the small cylinder, whenever the initially eccentrically placed tip assembly touches an edge of a workpiece, and as the edge of the workpiece is moved closer to being in line with the centerline of the millhead of the milling machine and the tip assembly is reactively moved progressively toward its concentric rotating position then this light emitting diode stays on longer during this return movement of this tip assembly, until its spot source of light at its circumference is continuously turned on and by virture of its speed of rotation the light appears to an observing machinist as a continuous ring of light or halo of light indicating to him that the center line of the chuck or collet and the mill head of the milling machine is only away from the edge of the workpiece by a distance equal to one half of the diameter of the cylindrical tip of the tip assembly of this locator tool; and

(d) electro-mechanical means to complete a potential circuit through the locator tool from its small cylinder, through the light emitting diode, and on to the cylindrical tip, which circuit is ultimately completed through the workpiece and the milling machine.

4,429,464

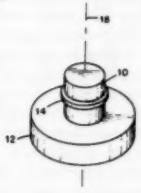
ROUNDNESS CALIBRATION STANDARD

Brice M. Burrus, 6620 Wachese La., Knoxville, Tenn. 37912

Filed Jan. 29, 1982, Ser. No. 343,804

Int. Cl.³ G01B 5/28

U.S. Cl. 33—174 Q **1 Claim**



1. In a roundness calibration standard formed on its perimeter with (1) a cylindrical surface and (2) an out-of-round calibration surface, the improvement comprising:

said calibration surface being a cylindrical surface with a radius of curvature greater than the radius of curvature of the remainder of the perimeter of said calibration standard.

4,429,465

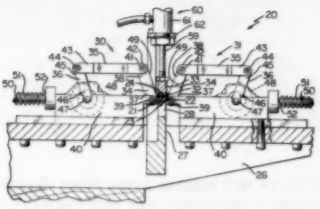
APPARATUS FOR MEASURING A BELT CONSTRUCTION AND METHOD OF MAKING SUCH APPARATUS

James D. Hill, Jr, Turnback Township, Lawrence County; David L. Alexander, Springfield, and Thomas W. Brooks, Nixa, all of Mo., assignors to Dayco Corporation, Dayton, Ohio

Filed Mar. 29, 1982, Ser. No. 362,722

Int. Cl.³ G01B 5/24

U.S. Cl. 33—174 E **26 Claims**



1. In an apparatus for measuring the angle of at least one side surface of an endless power transmission belt construction of the V-belt type wherein said belt construction has a top surface and a bottom surface with a pair of opposed non-parallel side surfaces therebetween, said apparatus having a first part against which said belt construction is adapted to be disposed in a belt construction measuring position thereof and having a second part pivotally mounted to pivot on an axis thereof and being adapted to be pivotally disposed against said one side surface to indicate the angle thereof by the relation of its pivoted position relative to a reference means when said belt construction is against said first part in said measuring position thereof, said apparatus having moving means operatively interconnected to said second part to tend to move the same toward said belt construction in a direction substantially transverse to said axis thereof when said belt construction is in said measuring position thereof the improvement wherein said apparatus has an angle indicating output device having a rotatable input member and wherein said second part comprises a plurality of pivotally interconnected links, one of said links having opposed ends, one of said opposed ends of said one link being pivotally mounted to said apparatus on said axis and the other of said opposed ends of said one link being pivotally mounted to said apparatus on said axis and the other of said opposed ends being pivoted to another of said links, said one link being adapted to be pivotally disposed against said one side surface of said belt construction, said links being interconnected to said angle indicating output device through said rotatable input member to operate said output device in relation to the pivoted position of said one link, and wherein said other link is pivotally interconnected to a third link of said plurality of links, said third link being secured to said input member of said device.

4,429,466

LAYOUT COMBINATION TOOL

Wilbur Leonard, 6200 SW. 17th St., Margate, Fla. 33068

Filed Nov. 9, 1981, Ser. No. 319,734

Int. Cl.³ G01B 3/30

U.S. Cl. 33—180 R **11 Claims**

1. Layout apparatus adapted to aid in the installation of a towel bar, a sanitary paper holder, a soap dish, a toothbrush holder, and other like devices on a wall comprising:

elongated frame means,

a pair of template pieces oppositely disposed along the length of said frame means, said template pieces having a substantially rectangular shape,

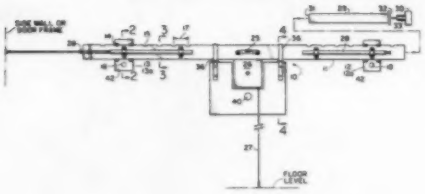
a third template piece attached to said frame means having a substantially rectangular shape,

measuring means attached to said frame means for position-

ing said layout apparatus relative to a horizontal reference line,

leveling means attached to said frame means positioning said layout apparatus against a substantially flat vertical surface; and,

said oppositely disposed template pieces comprising flat plates having a rectangular shape with the horizontal



centerline of said template pieces being aligned below a lower edge of said frame means such that a first outline of said frame means and said template pieces in combination with a second outline of said frame means and template pieces when rotated 180° and realigned with said first outline is an outline of a substantially complete towel bar including brackets.

4,429,467

APPARATUS FOR MEASURING TOE-IN OF A MOTOR VEHICLE WHEEL

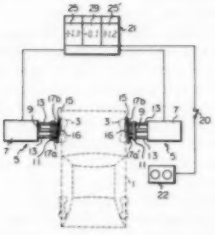
Yoichi Murata, Nagoya; Ryozo Kishishita, Toyota, and Tadao Nakata, Aichi, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Jun. 2, 1981, Ser. No. 269,719

Claims priority, application Japan, Jun. 10, 1980, 55-79854[U]

Int. Cl.³ G01B *5/24*

U.S. Cl. 33—203 **6 Claims**



1. Apparatus for measuring toe-in of a pair of left and right wheels of an automotive vehicle, the apparatus including a pair of units adapted to be positioned on opposite sides of a vehicle adjacent to corresponding wheels to be measured for toe-in, wherein each unit comprises:

an elongated contact member, the length of which corresponds approximately to the outer diameter of a tire on a wheel to be measured;

means for supporting the contact member with its longitudinal axis substantially horizontal and approximately parallel to the longitudinal axis of a vehicle being inspected, at a level corresponding approximately to the center of an adjacent wheel of the vehicle;

drive means for moving the support means toward and away from the adjacent wheel;

means for pivotally connecting the contact member to the support means to permit the contact member to uniformly contact front and rear laterally outermost side wall portions of a tire on said wheel adjacent to the respective ends of the contact member when the support member is moved toward the wheel by the drive means;

sensor means for detecting displacement of the horizontal axis of the contact member from a datum line parallel to the longitudinal axis of a vehicle being inspected, the sensor means comprising a pair of sensors carried by the support means and contacting the contact member at two longitudinally spaced points for providing signals indicating lateral displacement of said points from said datum line and means for calculating the difference between the displacement signals from said pair of sensors; and

indicator means responsive to the sensor means for displaying a transverse displacement corresponding to a toe-in value for the wheel when the contact member contacts the front end rear side wall portions of a tire thereon.

4,429,468

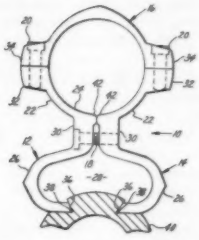
SEE-THROUGH TYPE TELESCOPE SIGHT MOUNT FOR FIREARMS

Ivan Jimenez, and Irving N. Rubin, both of 5555 Treadwell, Wayne, Mich. 48184

Filed Dec. 2, 1981, Ser. No. 326,635

Int. Cl.³ F41G *1/38*

U.S. Cl. 33—245 **7 Claims**

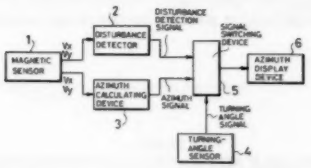


1. In a see-through type telescope sight mount system for a firearm the combination comprising a pair of mounting members, said pair of mounting members comprising respective first portions each defining a corresponding portion of a receptacle for the body of a telescope sight, said pair of mounting members further comprising respective second portions each defining a corresponding portion of a see-through, said second portions having respective free distal ends via which the mounting members operatively mount on a firearm, said pair of mounting members still further comprising respective third portions each joining the corresponding first and second portions of its own mounting member, means joining said first portions together opposite said third portions for securely clamping the body of a telescope sight, control coupling means operatively coupling said pair of mounting members between the respective third portions for controlling the span of the free distal ends of the second portions while the telescope sight remains securely clamped, and means operatively disposed between said pair of mounting members on at least one of said first portions opposite said joining means for spacing said third portions apart and providing a fulcrum about which said control coupling means is effective to control the span of the free distal ends of the second portions by pivotal action of said second portions about said fulcrum, said control coupling means being disposed between the fulcrum and said second portions.

4,429,469
DIRECTION DETECTION APPARATUS

Noboru Tsushima, Morioka; Makoto Tomoyori, Iwate, and Masatoshi Harumatsu, Tamayama, all of Japan, assignors to Alps Electric Co., Ltd., Japan

Filed Nov. 12, 1981, Ser. No. 320,523
Claims priority, application Japan, Nov. 13, 1980, 55-159897
Int. Cl.³ G01C *17/28*
U.S. Cl. 33—361 5 Claims

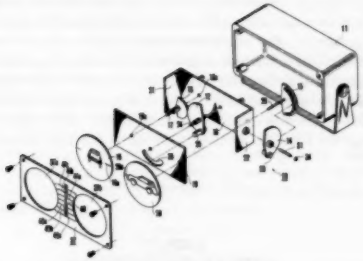


1. A direction detection apparatus for an automobile which includes a display means to show the direction of movement of the automobile, the direction apparatus further comprising a magnetic sensor means for sensing a geomagnetic azimuth and for producing an output signal in accordance with said azimuth, a turning-angle sensor means for dynamically sensing the turning angle of said automobile and producing an output signal in accordance with said turning angle, a magnetic-disturbance detector means for detecting a magnetic disturbance on the basis of the signal output of the said magnetic sensor means and producing a disturbance output signal upon said disturbance, and an automatic signal switching means for applying either the magnetic sensor means output signal or the turning-angle sensor means output signal to the said display device in accordance with said disturbance output signal from said magnetic-disturbance detector means.

4,429,470
INCLINOMETER

Noboru Watanabe, Tokyo, and Hiroshi Iiyama, Yokosuka, both of Japan, assignors to Jeco Co., Ltd., Kawasaki, Japan

Filed Jan. 4, 1982, Ser. No. 336,628
Claims priority, application Japan, Jan. 13, 1981, 56/3427[U]
Int. Cl.³ G01C *9/16*
U.S. Cl. 33—395 5 Claims



1. An inclinometer of the type wherein inclinations in the fore and aft and left and right directions of a vehicle are displayed independently, characterized by comprising:

first and second parallel shafts supported by a frame with a predetermined spacing;

a scale board mounted on a front surface of said frame;

a first display member mounted on a front end of said first shaft for displaying a rolling angle of said vehicle on which said inclinometer is mounted;

a second display member mounted on a front end of said second shaft for displaying a pitching angle of said vehicle;

a first detecting means, coupled with said first shaft, including a rolling weight of detecting a rolling angle of said vehicle relative to the gravitational direction, said rolling weight being rotatable on an axis parallel to the axis on which said first shaft rotates;

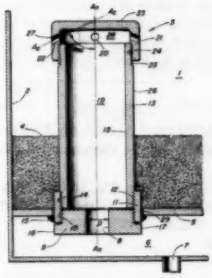
a second detecting means, coupled with said second shaft, including a pitching weight for detecting a pitching angle of said vehicle relative to the gravitational direction, said pitching weight being rotatable on an axis perpendicular to the axis on which said second shaft rotates; and

a common scale provided on said scale board and positioned between said first and second display members for displaying said rolling angle and said pitching angle as said display members rotate adjacent the common indices of said scale in response to their respective detecting means.

4,429,471
FLUIDIZED BED AIR DISTRIBUTOR

Stephen L. Goodstine, Windsor, and Glen D. Jukkola, Glastonbury, both of Conn., assignors to Conoco Inc., Wilmington, Del.

Filed Dec. 10, 1981, Ser. No. 329,545
Int. Cl.³ F26B *3/08, 17/10*
U.S. Cl. 34—10 17 Claims



1. A gas distributor comprising:

a nipple,

a cap,

and a bushing, wherein said cap is provided with at least one gas distribution passage, and said nipple includes a central nipple passage and said bushing includes a central bushing passage,

said cap being attached to a first end of said nipple said bushing being attached to a second end of said nipple

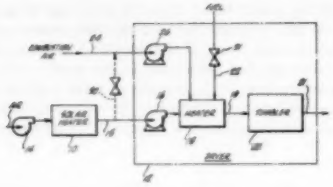
said nipple being cylindrical, said central nipple passage being cylindrical,

said bushing being cylindrical said central bushing passage being cylindrical, said central nipple passage and said central bushing passage being connected in fluid flow communication, the diameter of said central bushing passage being smaller than the diameter of said central nipple passage, whereby the flow of fluid into said central nipple passage is restricted by said smaller diameter of said central bushing passage.

4,429,472
SOLAR DRYER

Richard W. Dodelin, 4430 Jewell St., San Diego, Calif. 92109; Darrell W. Hurst, San Diego, and George R. Osos, Costa Mesa, both of Calif., assignors to Richard W. Dodelin, San Diego, Calif.

Filed Mar. 16, 1981, Ser. No. 243,740
Int. Cl.³ F26B *3/04*
U.S. Cl. 34—48 **10 Claims**

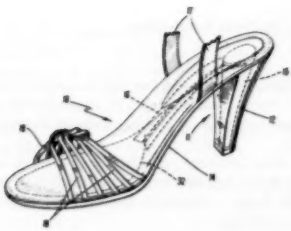


1. A method for drying fabrics comprising the steps of:
(a) selecting a solar heater capable of directly heating air;
(b) placing fabrics to be dried in a drying zone and tumbling the drying zone;
(c) during a first period of time partially drying the fabrics by the steps of:
(i) passing air through the solar heater to heat the air to a first temperature greater than ambient;
(ii) further heating the air in a non-solar heater to a second temperature of at least about 300° F.; and
(iii) introducing the further heated air to the tumbling drying zone containing fabrics; and
(d) during a second period of time immediately after the first period of time, cooling the drying zone and further drying the fabrics by the steps of:
(i) passing air through the solar heater to heat the air to a temperature greater than ambient; and
(ii) without further heating the air that has passed through the solar heater, introducing the air that has passed through the solar heater to the drying zone.

4,429,473
ATTRACTIVE LADIES HEELED SHOE

Kenneth Blumenstein, 110-11 Queens Blvd., Forest Hills, N.Y. 11375

Continuation-in-part of Ser. No. 66,043, Aug. 13, 1979. This application Sep. 17, 1981, Ser. No. 303,023
Int. Cl.³ A43B *3/12, 13/12*
U.S. Cl. 36—11.5 **8 Claims**

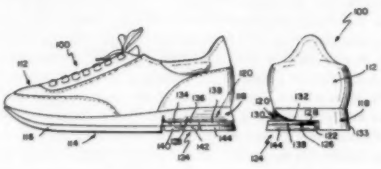


1. An attractive, sleek, comfortable, light weight ladies shoe comprising a hard molded, plastic unitary body forming an elevated heel, a shank and an outer sole; said body having a load bearing upwardly directed face and a flange extending upwardly approximately at right angles to the face and from the periphery of the outer sole; a resilient foam plastic soft cushion layer having a thickness of approximately one-quarter inch and an upper face as well as a bottom face bearing against the load bearing face of the body; a sheet of material covering the upper face of the cushion layer and secured to the upper face of the body underneath of the cushion; an upper secured in place between the upwardly directed face of the body and the bottom face of the cushion layer; the flange extending above a load bearing face of the sole by approximately three-eights of an inch so an upper surface of the sheet material is approximately coplanar with but slightly above an upper edge of the flange and the cushion layer, sheet of material and upper are held and captured in place by the flange and embedded in the body.

4,429,474
ADJUSTABLE MECHANICALLY CUSHIONED LATERAL BORDER OF THE HEEL FOR A SHOE

Robert D. Metro, 848 Roxbury La., Noblesville, Ind. 46060

Continuation-in-part of Ser. No. 313,454, Oct. 21, 1981. This application Dec. 31, 1981, Ser. No. 336,419
Int. Cl.³ A43B *21/36*
U.S. Cl. 36—36 A **8 Claims**



1. In a shoe including an upper portion and a lower portion having a sole and a heel area, the heel area having lateral and rear borders and spring-loaded means for cushioning the heel area, the improvement wherein the heel area includes a generally planar surface near the center of the heel area and an arcuate surface extending laterally outwardly and upwardly therefrom, the spring-loaded means includes at least one flexible cushioning member extending laterally generally parallel to the planar surface of the heel area, the planar and arcuate surfaces of the heel area providing a fulcrum at the lateral border for flexion of a distal portion of the cushioning member to produce a cushioning effect, and adjustment means for varying the cushioning effect of the spring-loaded means at the lateral border, the adjustment means including at least one elongated slot in the cushioning member and means received in the slot for securing the cushioning member to the heel area, the slot allowing the cushioning member to be moved laterally relative to the fulcrum at the lateral border of the heel area to change the spring constant of the distal portion thereof.

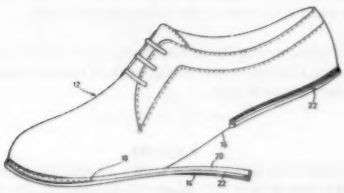
4,429,475
ARTICLE OF FOOTWEAR

Douglas W. Bensley, 1385 Commissioners Road West, London, Ontario, Canada

Division of Ser. No. 100,586, Dec. 5, 1979, Pat. No. 4,326,313. This application Apr. 27, 1981, Ser. No. 257,685
Int. Cl.³ A43B *23/00*
U.S. Cl. 36—45 **5 Claims**

1. An article of footwear comprising a pre-formed upper having a peripheral lower edge portion, a connecting strip attached to said lower edge portion and surrounding the upper, said connecting strip having a profiled section providing a projecting extension, a pre-formed ring-like welt member

having an inner surface in snapping engagement with the projecting extension of the connecting strip, and a pre-formed



sole and heel unit having an upper peripheral surface adhered to a lower surface of the welt member.

4,429,476

SELF-IMMERSING JET PUMP

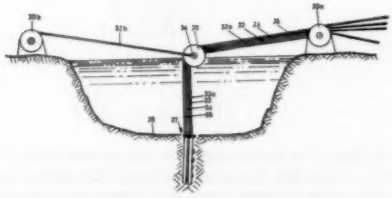
Anthony W. Wakefield, Wakefield House, Stamford, Lincolnshire, PE9 1BE, England

Filed Jun. 8, 1981, Ser. No. 271,214

Claims priority, application South Africa, Jun. 9, 1980, 80/3430

Int. Cl.³ E02F *3/88*

U.S. Cl. 37—62 **7 Claims**



1. A dredging apparatus for dredging material from a deposit, said apparatus comprising a jet pump, a float, a winch, adapted to be mounted on land adjacent to the material to be dredged, a cable connecting the winch to said float, for controlling the position of said float, and a plurality of hoses originating at a location remote from said float, said jet pump including means for receiving and for discharging fluid and including nozzles through which said fluid will be discharged to erode material surrounding said jet pump, said float comprising a body with means for supporting said hoses wherein said hoses are adapted to convey fluid to and from said jet pump respectively, and wherein said floating body has a curved surface with a radius of curvature sufficient to accommodate flexure of said hoses and has a buoyancy sufficient to overcome the downward drag of said hoses.

4,429,477

PORTABLE DITCHER AND EXCAVATING ELEMENTS THEREFOR

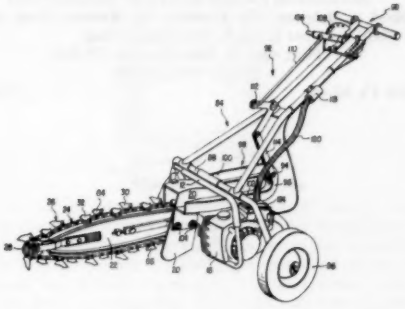
Bernard O. Tice, St. Marys, and Gene E. Bailey, Parkersburg, both of W. Va., assignors to Ditcher Saw Company, St. Marys, W. Va.

Filed Jul. 28, 1980, Ser. No. 172,653

Int. Cl.³ E02F *5/06*

U.S. Cl. 37—80 R **7 Claims**

1. A portable trencher having a cutter bar supporting an excavating chain run in driving engagement with a power transmission unit rigid with said cutter bar and including operator support handles fore and aft of said unit; a plurality of right hand teeth secured to one side of said chain in alternating relation with a plurality of left hand teeth secured to the other side of said chain; said right and left hand teeth being mirror images of one another; each of said teeth including a straight, upper mounting portion and a lower earth engaging portion; said lower earth engaging portion including a forward excavating portion extending laterally outward of said chain and mounting portion to terminate in a leading excavating point defining the lateral most extent of the tooth outwardly of said



chain; the trailing end of said lower earth engaging portion of each of said teeth extending laterally inwardly of said upper mounting portion to terminate in a plane of the following inner chain link; an additional right hand tooth secured to the said other side of said chain and an additional left hand tooth secured to said one side of said chain; and, in combination with said trencher, a two-wheeled dolly; and means, including one of said operator support handles, for stably mounting said trencher on said dolly for trenching operations.

4,429,478

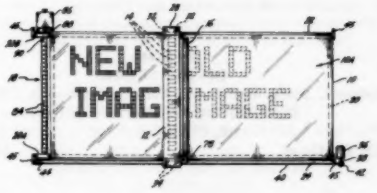
VARIABLE INFORMATION SIGN

James Bruce-Sanders, 4184 Rose Crescent, West Vancouver, B.C., Canada (V7V 2N8)

Filed Jun. 26, 1981, Ser. No. 277,707

Int. Cl.³ G09F *19/06*

U.S. Cl. 40—447 **28 Claims**



1. A variable information sign comprising:

a display member having a smooth and substantially nonporous display surface;

a plurality of print modules disposed in proximity to said display member and facing said display surface, each said print module including a pad of porous material containing a dry erase ink and being selectively-actuable to bring said pad into contact with said display surface so as to print an image in the form of a matrix of discrete areas of ink thereon;

erase means disposed in proximity to said display member and facing said display surface for wiping said display surface to remove any image thereon; and,

means for producing relative motion between said display member and said plurality of print modules and between

said display member and said erase means, said plurality of print modules and said erase means being arranged so that upon said relative motion, any previously-printed images are first removed from said display surface by said erase means and an image of information desired to be displayed is thereafter formed on said display surface as said plurality of print modules are selectively actuated.

4,429,479

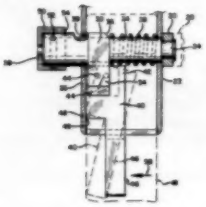
MAGAZINE LATCH RELEASE MECHANISM

David A. Johnson, 133 Eulalona Ct., Klamath Falls, Oreg. 97601, assignor to J.F.S., Inc., Salem, Oreg.

Filed Apr. 26, 1982, Ser. No. 371,959

Int. Cl.³ F41C *27/00*

U.S. Cl. 42—6 **7 Claims**



1. In a repeating firearm having a receiver defining a location for a removable magazine and including laterally spaced-apart generally upright walls extending rearwardly of said location, and also having a magazine latch mechanism including a laterally extending axially slidable shaft mounted in said receiver and carrying a catch attached thereto, a magazine latch release mechanism, comprising:

(a) biasing means for urging said shaft axially toward a first wall of said receiver;

(b) sleeve means surrounding said shaft and extending through said first wall; and (c) lever means for moving said shaft axially away from said first wall, said lever means having an upper end pivotably attached to said sleeve means, a lower end extending downwardly beneath said receiver, and fulcrum means located intermediate said upper and lower ends for acting against an interior surface of said first wall of said receiver for moving said shaft axially away from said first wall in response to movement of said lower end toward said first wall.

4,429,480

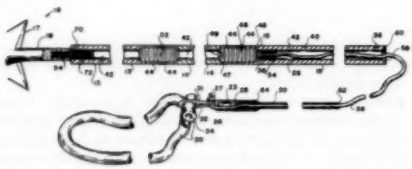
DIVING SPEAR

Rodney C. Stude, 8163 E. Mineral Dr., Englewood, Colo. 80110

Filed Mar. 24, 1982, Ser. No. 361,450

Int. Cl.³ A01K *81/04*

U.S. Cl. 43—6 **13 Claims**



1. A diving spear with increased range capabilities for use in underwater fishing and the like comprising:

(a) elongate shaft means for mounting a spear head having a forward end and an aft end said aft end comprising an elongate bore therein;

(b) flexible string means insertable in said bore for increasing the range of said spear and comprising a first end and a second end said first end of said string means operably attached within said bore;

(c) stretchable elastic thrusting means for providing longitudinal thrust to said shaft means operably attached to said second end of said string means and comprising an unstressed state and an elastically stressed state;

and

(d) holding means for immobilizing a portion of said thrust means relative to said elongate shaft means in said thrust means stressed state.

4,429,481

SPIN-CASTING ROD WITH LURE JERKING ASSEMBLY

David H. Handa, 4 N. 525 Route 83, Bensenville, Ill. 60106

Filed Oct. 16, 1981, Ser. No. 312,006

Int. Cl.³ A01K *87/00, 97/00*

U.S. Cl. 43—19.2 **12 Claims**

7. A fishing rod reel assembly for line and lure fishing, comprising; a main rod having a plurality of line guides spaced along its length including a butt guide, a reel seat connected to the rod, a line casting reel connected to the reel seat, and a substantially straight jerk rod means for imparting intermittent motion to the line payed-out from the reel, said jerk rod means having a top guide at the end thereof positioned between the butt guide on the main rod and the reel, said jerk rod means being pivotally mounted on the reel side of the main rod about an axis between the top guide and the reel for movement between a first position substantially and closely adjacent and parallel to the main rod with the jerk rod means top guide coaxially aligned with the butt guide so the jerk rod means does not hinder line movement in its first position, and a second position where the top guide is substantially misaligned with respect to the butt guide, said jerk rod means having a handle extending from the pivotal axis thereof toward the reel for manipulation by the fisherman's hand while on the main rod.

4,429,482

SIMULATED FISH SKIN AND FISHING LURE

James A. Honse, 211 Anita Forte Dr., Swansboro, N.C. 28584

Continuation-in-part of Ser. No. 42,412, May 25, 1979, Pat. No. 4,307,531. This application Oct. 13, 1981, Ser. No. 310,963

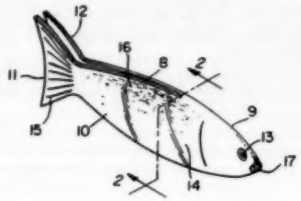
The portion of the term of this patent subsequent to Dec. 29, 1998, has been disclaimed.

Int. Cl.³ A01K *85/00*

U.S. Cl. 43—42.32 **5 Claims**

1. A simulated fish skin lure consisting of two body halves with each half consisting of a single outer layer of clear plastic material and a single inner layer of a flexible reflective mate-

rial, said halves being joined together to form a joined forward portion and a split rear portion, the halves of the forward

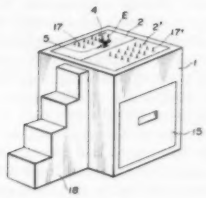


portion form a single unitary head and the halves of the rear portion form a split tail.

4,429,483
AUTOMATIC RAT KILLING DEVICE

Hideaki Murakami, 724-3 Koikecho, Hamamatsushi, Shizuoka-ken, Japan

Filed Mar. 17, 1982, Ser. No. 358,909
Claims priority, application Japan, Apr. 25, 1981, 56-62756
Int. Cl.³ A01M *23/06*
U.S. Cl. 43—70 **3 Claims**

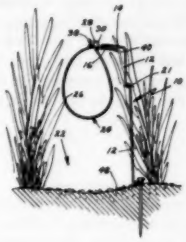


1. An automatic rat killing device comprising:
(a) a box having an opening at its top and a stairway leading to its top;
(b) a pair of closure plates pivotally mounted at their one ends on said box for movement between horizontal positions where said pair of closure plates are mated together at their other ends to close said opening and vertical positions where said pair of closure plates are separated apart to open said opening;
(c) a solenoid mounted on said box and having a stop lever normally engaged with said closure plates to hold them in their horizontal positions;
(d) a container removably mounted at the lower portion of said box, said container holding a viscous liquid;
(e) a bait support member for holding a bait;
(f) a detector connected to said bait support member for generating a detecting signal when a rat touches said bait, said solenoid being energized in response to said detecting signal to move said stop lever out of engagement with said closure plates so that said closure plates are pivotally moved to their vertical positions to open said opening, thereby causing the rat to fall into said viscous liquid in said container; and
(g) a returning mechanism mounted on said box and operable to return said closure plates from their vertical to horizontal positions, upon returning of said closure plates to their horizontal positions said solenoid being de-energized to return said stop lever to its initial position to cause said stop lever to engage said closure plates, thereby holding them in their horizontal positions.

4,429,484
ANIMAL SNARE SUPPORT

Ardell M. Grawe, Box 167, Rte. 2, Breckenridge, Minn. 56520

Filed Jul. 26, 1982, Ser. No. 402,091
Int. Cl.³ A01M *23/34*
U.S. Cl. 43—87 **6 Claims**

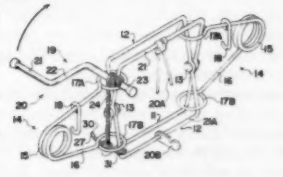


1. An animal snare support for use with an animal snare which includes a length of flexible snare wire having an anchored end and a loop end portion, a snare lock encompassing a first loop end portion and a second intermediate portion of the snare wire to form a snare loop in between, means to prevent the first loop end portion of the snare wire from escaping from the snare lock, the lock and snare wire being so constructed that the intermediate portion of the snare wire runs freely through the snare lock in direction to close the snare loop, the animal snare support including:
an elongate shank;
support means to affix a first end portion of said shank in fixed relation to the ground;
a substantially horizontal bar having a first end portion integral with a second end portion of the shank;
an elongated, hollow, snare support collar attached with respect to a second end portion of said bar and encompassing a portion of the flexible snare wire between the snare lock and the anchored end of snare wire, said collar being provided with an opening therethrough which has an axis lying at an acute angle above horizontal measured from the anchored end of the snare wire toward the loop end;
anchor means for preventing the anchored end of the snare wire from escaping from the support collar; and
the relationship between the snare support collar encompassed portion of the flexible snare wire being such that the axis of the snare wire within and slightly beyond the snare support collar is held at an angle above horizontal in direction toward the loop end portion of the wire.

4,429,485
TRAP SETTING DEVICE

Norman Dubray, Box 72, Oak River, Manitoba, Canada R0K 1T0

Filed Mar. 29, 1982, Ser. No. 362,768
Int. Cl.³ A01M *23/28*
U.S. Cl. 43—97 **7 Claims**



7. A method of setting traps of the conibear type comprising the steps of engaging a ring engaging member secured to the

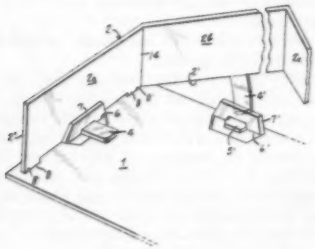
distal end of a cord and cable, through the top ring of one of a hairpin type spring of said conibear trap and then through the bottom ring thereof, positioning said ring engaging member to prevent disengagement thereof from said bottom ring, engaging the windlass portion of a hand crank across the top ring with the cord or cable extending upwardly from the ring engaging member, through said bottom ring, and through said top ring and being secured to said windlass portion, rotating said crank with said windlass portion acting as a fulcrum across said upper ring, thereby winding said cord or cable upon said windlass portion and drawing said rings together and then detachably locking the arms carrying the rings, in the closed position, and then repeating the process on an opposite hairpin type spring.

4,429,486

CONSTRUCTION AND METHOD FOR MODELS WITH INTERLOCKING TAB/SLOT ASSEMBLY

Arne Bjornstad, Vagsbygd, Norway, assignor to Minilife A/S, Kristiansand, Norway

Continuation of Ser. No. 305,325, Sep. 24, 1981. This application Dec. 6, 1982, Ser. No. 447,011
Int. Cl.³ A63H *33/16*
U.S. Cl. 46—21 **20 Claims**



1. Construction set for a model house of the type having individual components of a thin foldable material such as sheets of cardboard provided with tabs and slots which in assembly are intended to interlock to hold the components together, comprising:

a first sheet member provided with at least two fold-up tabs, each having a slot arranged at its root, and at least one slot formed directly in said sheet member adjacent one of said fold-up tabs;

a second sheet member, the latter being foldable such that corners providing at least three walls can be formed therefrom upon folding;

tongue means, on the first wall and on at least one other of said three walls, extending from one of the two edges of said second sheet member which are common to said walls for respective engagement in said fold-up tab slots in said first sheet member;

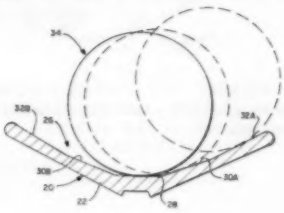
a projection on the first of said three walls located on said one common edge thereof to one side of and spaced from said tongue means for engagement with said direct slot in said first sheet member, said tongue means in the assembled state of said sheet members being disposed in said fold-up tab slots and bent at right angles relative to said projection which is disposed in said direct slot holding the folded walls of said second sheet member substantially perpendicular to the first sheet member.

4,429,487

BALL WHIRLING TOY AND METHOD OF EXERCISE USING SAID TOY

Ottilia Z. Taylor, San Carlos, and Janos J. Lazar, Redwood City, both of Calif., assignors to Injection Mold Partners, Ltd., San Rafael, Calif.

Continuation-in-part of Ser. No. 175,077, Aug. 4, 1980, abandoned. This application Jul. 20, 1981, Ser. No. 285,005
Int. Cl.³ A63H *33/00*
U.S. Cl. 46—43 **7 Claims**



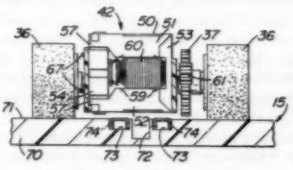
1. A ball whirling toy comprising: means defining an annular track having a radially inwardly facing concave surface, said surface consisting of a plurality of distinct, directly adjacent side-by-side annular surface segments greater in number than two, each of which has a substantially straight cross-section extending at an obtuse angle with any directly adjacent surface segment such that the overall cross-section of the radially inwardly facing concave surface is substantially wider than it is deep; a ball sized to fit on said track in tangential relationship with any one of said surface segments, said surface segments consisting of a central segment extending in a direction parallel with the axis of said track, a pair of intermediate surface segments on opposite sides of and directly next to said central segment and a pair of outer surface segments on the otherwise free sides of and directly next to said intermediate segments; and handle means connected with said track defining means, whereby said ball may be placed on said track and said handle means moved in predetermined ways to cause said ball to move around said track on any one of said surface segments or from said one segment to a next adjacent segment depending upon the particular movement of said handle means and the orientation of said track and whereby said ball is capable of moving across all of said segments and off of the track unless this is prevented by the appropriate manipulation of said handle means.

4,429,488

ELECTRIC VEHICLE WITH MAGNETIC ATTRACTION TO TRACKWAY

John A. Wessels, 125 Campanita Ct., Monterey Park, Calif. 91754

Filed Oct. 13, 1981, Ser. No. 310,807
Int. Cl.³ A63H *18/12*
U.S. Cl. 46—257 **2 Claims**



1. A model vehicle for movement along a track having a pair of magnetically permeable rails, said vehicle comprising a non-magnetic chassis, track-engageable running gear on said

chassis, a motor carried by said chassis in driving relation with said running gear and positioned on said chassis for location above said rails when said running gear is engaging said track, said motor comprising a yoke, magnet holders in said yoke, an armature rotatable about a horizontal axis transverse to said rails and within said yoke between said magnet holders, and magnets in said holders for magnetically effecting rotation of said armature, said yoke and magnet holders being non-magnetic so that said motor is essentially non-magnetic except for said armature and magnets, whereby magnetic flux from said magnets is not constrained, for increased magnetic coupling of said magnets with said rails to increase force by said chassis toward the track.

4,429,489

BOX-SHAPED CONTAINER FOR USE AS A COLD FRAME

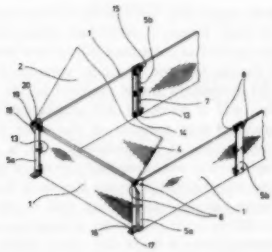
Artur Fischer, Weinhalde 34, D-7244 Tumlingen 3, Fed. Rep. of Germany

Filed Mar. 22, 1982, Ser. No. 360,637

Claims priority, application Fed. Rep. of Germany, Apr. 16, 1981, 3115355

Int. Cl.³ A01G *9/06*

U.S. Cl. 47—18 **11 Claims**



1. A box-shaped container for use as a cold frame, comprising a plurality of side wall panels; a cover, said side wall panels and said cover being formed as hollow transparent panels made of plastics and including face panels and cavity-forming ribs extending between said face panels, said side wall panels being formed with bores; and connecting means to connect adjacent side wall panels to each other, said connecting means each including a connecting element having two faces abutting against respective ends of the side wall panels, portions connected to and extending at right angles from said stop faces, said portions being formed with holes arranged in assembly in alignment with said bores, stud pins each having a circumferential groove and inserted into the respect hole and extended into the respective bore, and a locking element having a slot and locked on the respective stud so that pin said slot engages the circumferential groove of the respective stud pin.

4,429,490

DOOR CONTROL SWITCHING DEVICE

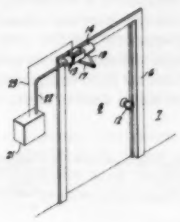
Richard L. Zunkel, Princeton, Ill., assignor to Schlage Lock Company, San Francisco, Calif.

Filed Mar. 1, 1982, Ser. No. 353,622

Int. Cl.³ E05F *15/10*

U.S. Cl. 49—32 **10 Claims**

1. In a door control switching device for a door panel hinged to rotate in a door frame and having a shaft rotatable about an axis and interconnected with said panel and said frame for rotation of said shaft into rotary positions corresponding to the rotary positions of the door panel in the door frame and having means incorporating a controlling switch contact for rotating said panel relative to said frame, the combination of a hub projecting eccentrically from said shaft, an arm having opposite ends, and means disposing one of said ends frictionally engaging said hub for movement of one of said ends in an orbital path relative to said shaft axis and disposing the other of said ends freely alongside said switch for arcuate movement



directly toward and away from abutment with said switch contact and for another movement normal to said arcuate movement and transversely across said switch contact between a first position and a second position.

4,429,491

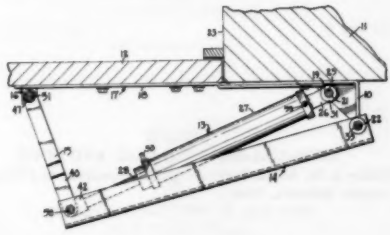
DOOR OPERATOR APPARATUS

James A. Bruns, Grand Rapids, Minn., assignor to Abe W. Mathews Engineering Co., Hibbing, Minn.

Filed Oct. 13, 1981, Ser. No. 310,505

Int. Cl.³ E05F *11/24*

U.S. Cl. 49—340 **6 Claims**



1. A mechanism for operating a panel rotatably mounted to a frame, comprising:

(a) actuator means, attached at one end to the frame, for providing a linear pulling and pushing force;

(b) means for linking said actuator means to the panel; and

(c) means for transferring the linear force of said actuator means into an opening and closing force for said panel, said transferring means including a first elongated member pivotally attached at one end thereof to said frame, said linking means including a second elongated member pivotally connected at one end thereof to the panel, said actuator means being pivotally attached at a second end to second ends of said first and second elongated members so as to form a common pivot point.

4,429,492

DOOR COORDINATOR

William B. Imhoff, Springdale, Conn., assignor to Leigh Products, Inc., New Haven, Conn.

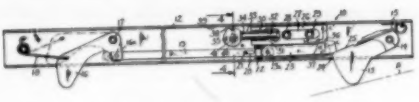
Continuation-in-part of Ser. No. 342,750, Jan. 26, 1982, abandoned. This application Sep. 23, 1982, Ser. No. 422,169

Int. Cl.³ E05C *7/05*

U.S. Cl. 49—367 **8 Claims**

1. A system for coordinating the closing of a pair of doors oppositely hinged to a frame, one door being active and the other inactive, comprising a housing member adapted to be mounted to the door frame, a first holding lever pivotally

mounted to said housing adjacent one end thereof and extending from said housing to hold the active door open until the inactive door closes, a second lever pivotally mounted in said housing and positioned to be engaged by the inactive door adjacent the free end thereof, a rod having a free end pivotally connected to said second lever and extending to a position to prevent inward movement of said first lever whereby when the inactive door engages said second layer and pivots said second lever said rod is retracted from engagement with said holding lever to permit said active door to close,



means biasing said second lever toward an extending position, a member slideable in said housing and in contact with the free end of said rod to normally prevent movement of said rod toward said second lever, and means biasing said member into engagement with the free end of said rod,

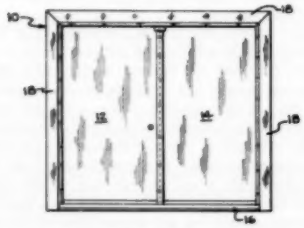
said free end of said rod having engagement with said holding lever such that when sufficient force is appllied to said holding lever it will force said rod toward said second lever over the bias of said biasing means on said slideable member.

4,429,493

ASTRAGAL HOUSING SEAL AND LOCK

William R. St. Aubin, Perrysburg, Ohio, assignor to LST Corporation, Sylvania, Ohio

Filed Sep. 27, 1982, Ser. No. 424,220
Int. Cl.³ E05C 7/04
U.S. Cl. 49—367 **14 Claims**



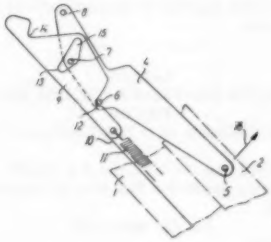
1. An improved astragal for use in a double door assembly having an active door and a relatively inactive door, such doors being pivotally mounted over a sill in a surrounding frame and having their free vertical edges adjacent one another, said astragal comprising: a vertically extending mullion housing positioned between the free vertical edges of such doors, said mullion housing being attached to such relatively inactive door, and a vertically extending slide section mounted on said mullion housing of such inactive door and adjacent the sealing sides of such inactive door and such active door when such active door is in the closed position, said slide section being vertically movable relative to said mullion housing between a locked position and an unlocked position.

4,429,494

WINDOW, ESPECIALLY FOR INSTALLATION IN AN INCLINED ROOF

Klaus Kornerup, Birkerod, Denmark, and Per B. Christensen, Puerto del Carmen Lanzarote, Canary Islands, assignors to V. Kann Rasmussen Holding A/S, Soborg, Denmark

Filed Sep. 17, 1982, Ser. No. 419,328
Claims priority, application Denmark, Dec. 8, 1981, 5421/81
Int. Cl.³ E05F 1/10
U.S. Cl. 49—386 **3 Claims**



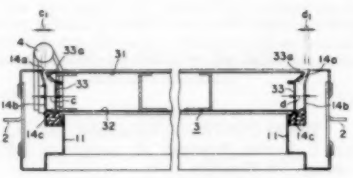
1. A window, especially for installation in an inclined roof, comprising a main frame, a secondary frame element top-hinged therein, and a frame element lifting lever inserted therebetween and having one end pivotally connected with a side member of the secondary frame element or the main frame while its other end is pivotally and displaceably connected with the associated side member of the main frame or the secondary frame element, respectively, and is urged by a spring for displacement along said side member in a direction away from the hinge point between the main frame and the secondary frame element, said other end of the secondary frame element lifting lever presenting at least two pivot points having different distances from the pivot point at the first mentioned end of the lever and being, moreover, located so as to successively becoming operative during the opening of the window to succesively increasing the effective length of the lever.

4,429,495

DOOR FOR BUILDINGS

Kiyomi Aoki, Yokohama, Japan, assignor to Mitsui Metal Processing Co., Ltd., Tokyo, Japan

Filed Aug. 6, 1981, Ser. No. 290,494
Int. Cl.³ E06B 3/00
U.S. Cl. 49—501 **9 Claims**



1. A door for buildings, said door being provided with a lock and hung within a door frame so as to swing on hinges fastened to the door and the door frame, said door frame being fixed in a doorway in a building wall, wherein

the outside panel of said door is larger in area than the inside panel thereof,

the four edge faces of said door are provided on their outside portions with acute-angled projecting portions,

the outside portions of the inner faces of said door frame are inclined toward the outside,

clearances of at least 6 mm each between said inner faces of said door frame and the inner portions of said edge faces of said door are provided, and

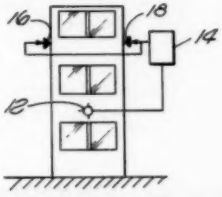
said clearances between said inner faces of said door frame and said edge faces of said door decrease toward the outside.

4,429,496

METHOD AND APPARATUS FOR ACTIVE CONTROL OF FLEXIBLE STRUCTURES

Sami F. Masri, Pasadena, Calif., assignor to University of Southern California, Los Angeles, Calif.

Filed Dec. 24, 1980, Ser. No. 219,699
Int. Cl.³ F16M *13/00*; E04H *9/02*
U.S. Cl. 52—1 **11 Claims**



1. A method for minimizing the stress to, and/or deformation of, a flexible structure subjected to a dynamic environment comprising the steps of:

(a) selecting a threshold state for said structure;

(b) sensing the state of said structure in response to said dynamic environment;

(c) transmitting the value of at least one corrective energy pulse only when the state of said structure exceeds said threshold; and

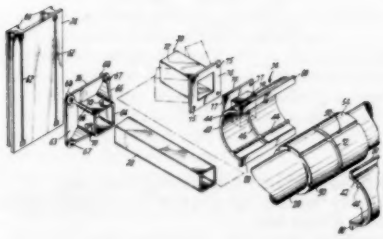
(d) applying at least one corrective pulse to said structure within one period of its lowest mode of vibration to disorganize the buildup of the amplitude of harmonic vibrations therein.

4,429,497

PIPE SUPPORT SYSTEM

Peter A. Dibernardi, 1 Cindy Dr., St. James, N.Y. 11780

Filed Apr. 10, 1981, Ser. No. 252,875
Int. Cl.³ E04F *19/00*
U.S. Cl. 52—27 **21 Claims**



1. A pipe support for securing pipes to a structural element, such as a wall, to prevent the movement of the pipes relative to said structural element, said pipe support system comprising:

a generally cylindrical pipe, with a portion of the outer surface of said pipe including at least one axial engaging means and at least one circumferential engaging means formed on said pipe outer surface portion;

a generally cylindrical clamp, with the inside diameter of said clamp substantially corresponding to the outside diameter of said pipe and with the inner surface of said clamp including at least one complimentary axial engaging means and at least one complimentary circumferential engaging means formed on said clamp, said pipe being receivable within said clamp such that each said complimentary axial engaging means and axial engaging means are aligned and interlocked, and each said complimentary circumferential engaging means and circumferential engaging means are aligned and interlocked to prevent said pipe from shifting in both the axial and radial directions substantially without welding said clamp to said pipe; and

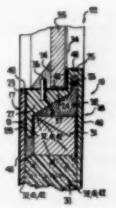
means for rigidly connecting said clamp to said structural element whereby said pipe is supported and prevented from moving relative to said structural element.

4,429,498

ATMOSPHERIC RESISTANT DOORS

William V. Pitt, P.O. Box 7622, Waco, Tex. 76710

Continuation of Ser. No. 259,355, Apr. 30, 1981, Pat. No. 4,374,693. This application Sep. 30, 1982, Ser. No. 429,661
The portion of the term of this patent subsequent to Jan. 17, 1997, has been disclaimed.
Int. Cl.³ E06B *3/54*
U.S. Cl. 52—204 **11 Claims**



1. A door which is resistive to chemical attack and to high moisture environments and has a relatively impermeable homogeneous surface finish and low surface porosity comprising a pair of one-piece, integral, molded, generally parallel flat plates each including top, bottom and a pair of side edges, said edges of each plate collectively defining an outer peripheral edge of each plate, said outer peripheral edges being disposed in generally aligned relationship, each plate being constructed of a completely cured admixture of unfoamed polymeric resin and reinforcing material resistant to corrosive and/or high humidity environments, said plates being disposed in generally spaced parallel relationship and defining therebetween an interior chamber, each plate having an outer exterior surface devoid of exteriorly exposed reinforcing material means for securing said plates to each other generally at said outer peripheral edges, first and second means wholly inboard of each associated peripheral edge for defining first and second openings in and through said first and second plates, respectively; said first means including a pair of walls of said first plate disposed generally normal to each other and defining a continuous corner, said pair of walls having exterior surfaces devoid of exteriorly exposed reinforcing material, a window seated in said opening, means for securing said window so seated in said opening, and means for securing one of said pair of walls to said second plate.

4,429,499
REINFORCED BRICK ASSEMBLY

So Kato, Seto, Japan, assignor to Kunishiro Co., Ltd., Japan

Filed Mar. 16, 1981, Ser. No. 244,018
Claims priority, application Japan, Jun. 30, 1980, 55-90591[U]; Jun. 30, 1980, 55-90592[U]; Jun. 30, 1980, 55-90593[U]
Int. Cl.³ E04C 3/10
U.S. Cl. 52—228 3 Claims

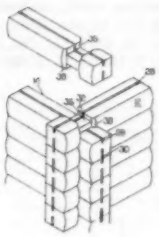
1. A reinforced brick assembly comprising:
a plurality of brick units;
said brick units being stacked in a horizontal and a vertical dimension to form a brick panel;
mortar between adjacent ones of said brick units in said brick panel;
a plurality of holes in said brick units;
at least one of said plurality of holes in at least some of said brick units being aligned with a hole in a vertically adjacent brick unit;
the aligned holes being aligned through at least said vertical dimension of said brick panel;
a vertical steel bar passing in the vertical dimension completely through all of said aligned holes;
mortar in said aligned holes surrounding said vertical steel bar;
a first support plate at a bottom of said brick panel;
a second support plate at a top of said brick panel;
a first end of said vertical steel bar passing through said first support plate and a second end of said vertical steel bar passing through said second support plate;
means on said first and second ends outside said first and second support plates for prestressing said vertical steel bar in said mortar;
at least one horizontal steel bar in said mortar between at least one vertically adjacent pair of horizontal rows of said brick units;
a support means in said mortar between first and second vertically adjacent brick units;
an upper half leg on said support means passing vertically upward into a hole in said first brick unit;
a lower half leg on said support means passing vertically downward into a hole in said second; and
mortar in said holes surrounding said upper and lower half legs.

4,429,500
BUILDING LOGS WITH WEATHERTIGHT JOINTS

Johann H. Farmont, 433 Golden Gate Ave., Belvedere, Calif. 94920

Filed Oct. 10, 1980, Ser. No. 195,949
Int. Cl.³ E04B 1/10
U.S. Cl. 52—233 3 Claims

1. A building log comprising:
a length of timber having outer and inner side surfaces, and generally planar top and bottom surfaces;
a segment of said length adjacent one end thereof being cut in at top and bottom and both sides to a reduced cross section adapted to receive at top and bottom, like segments of other timbers disposed normal thereto;
transition surfaces between both side surfaces and said reduced cross-section disposed at 45° to said side surfaces;
a pair of parallel, tapered tongues along one of said planar surfaces and a pair of complementary tapered grooves along the other of said planar surfaces;
fingers extending from an end of said length with spaces therebetween adapted to receive like fingers extending from an adjacent length;

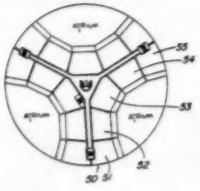


a metal plate having a plurality of pointed projections depending from the bottom surface thereof in areas adjacent both ends thereof only leaving the top surface of said metal plate in said end areas unobstructed for driving said pointed projections into said timber length and said adjacent length; and
a further plurality of pointed projections extending upward from said metal plate intermediate said end areas thereof to penetrate the bottom surface of a log supported thereon.

4,429,501
ATRIUM BUILDING STRUCTURE

Jean Y. de Brabant, 8 Chelsea Pl., Montreal, Quebec, Canada H3G 2J9

Continuation-in-part of Ser. No. 380,879, May 21, 1982. This application Jul. 14, 1982, Ser. No. 398,002
Claims priority, application Canada, Jul. 23, 1981, 382360
Int. Cl.³ E04H 1/00
U.S. Cl. 52—236.2 4 Claims



1. A multi-story exterior atria building comprising:
a multi-story habitable space which in horizontal section includes at each story,
a central area, and
three radially extending spokes surrounding said central area and symmetrically extending outwardly from said central area,
each of said radially extending spokes being habitable and having,
an outer end wall, and
a pair of side walls extending in a generally radial direction and each of said side walls having at least one transparent portion;
the inner ends of adjacent side walls of each successive pair

of spokes being joined to form in horizontal section a shallow U;

a transparent circumferential wall extending between each pair of joined side walls at the outer ends thereof throughout the height of said multi-story building to define thereby an exterior atrium such that three exterior atria extend about said multi-story building; and

the walls of the shallow U's being so constructed and oriented in relation to one another as to provide from within the habitable space, through any one of the transparent portions of said side walls, a view of substantially the whole area of the adjoining atrium and a broad view of the outdoors through the transparent circumferential wall while providing only an oblique view of other portions of the same U thereby substantially minimizing the visual exposure thereof.

4,429,502

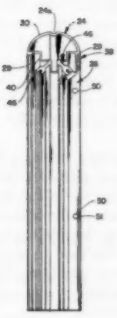
TRANSIT SHELTER

Joseph E. Kinnebrew, IV, 13300 Beckwith Dr., NE., Lowell, Mich. 49331

Filed Mar. 18, 1981, Ser. No. 245,159

Int. Cl.³ E04C *3/30*

U.S. Cl. 52—263 **34 Claims**



1. An elongated rib for defining the frame of a shelter which includes at least one panel, said rib comprising:

an elongated mullion having a hollow, box-like configuration, said mullion defining an exterior surface joined to a central protrusion, said protrusion defining a panel abutment surface, and said mullion further including a connector element extending from said protrusion;

an elongated plate having lateral edges;

fastener means engaging said plate for securing said plate to said connector element, one of said lateral edges of said plate and said mullion defining a slot for receipt of a panel, said mullion and plate being dimensioned so that a panel is held under pressure within said slot, said mullion further defining another panel abutment surface oriented substantially normal to said panel abutment surface;

another elongated plate, said mullion including another connector element and said another plate and said mullion defining another panel receiving slot extending generally normal to said a slot; and

additional fastener means engaging said another elongated plate for securing said another plate to said another connector element of mullion.

4,429,503

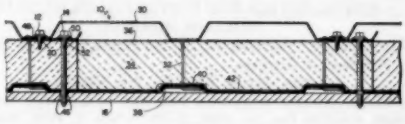
INSULATED PANEL

William H. Holliday, Richmond, Va., assignor to Reynolds Metals Company, Richmond, Va.

Continuation of Ser. No. 53,228, Jun. 29, 1979, abandoned. This application Oct. 1, 1980, Ser. No. 192,896

Int. Cl.³ E04B *1/32*; E04G *11/04*

U.S. Cl. 52—410 **8 Claims**



1. In a panel structure for heat insulating vessels, said panel structure comprising a plurality of surface panels, heat insulation material, means for fastening said surface panels to one another and means for fastening said panel structure to said vessel, the improvement wherein said means for fastening said surface panels to one another comprises stitching fasteners, said stitching fasteners being out of direct thermal contact with said vessel and said stitching fasteners having their heads directly exposed to outside air and wherein said means for fastening said panel structure to said vessel consists of mounting fasteners, said mounting fasteners being in direct thermal contact with said vessel and said mounting fasteners being entirely located beneath the outside surface of said panel structure such that said mounting fasteners are not directly exposed to outside air, said mounting fasteners providing the sole direct thermal contact link between said vessel and said surface panels, whereby heat losses from said vessel through said panel structure by means of said stitching fasteners and said mounting fasteners are reduced to a minimum and easy access to said vessel through said panel structure is provided.

4,429,504

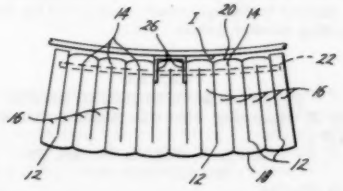
FIBER BLANKET INSULATION MODULE

Mack A. Hounsel, and Carlisle O. Byrd, Jr., both of Houston, Tex., assignors to Manville Service Corporation, Denver, Colo.

Continuation-in-part of Ser. No. 245,946, Mar. 20, 1981, Pat. No. 4,381,634. This application Oct. 8, 1981, Ser. No. 309,594

Int. Cl.³ E04B *1/80*

U.S. Cl. 52—506 **15 Claims**



1. An insulating module adapted for mounting adjacent an arcuate surface in a furnace or the like, said module comprising

(a) a block of refractory ceramic fiber having an inner surface exposed to the high temperature environment of said furnace, an outer surface to be mounted adjacent an inner surface of the furnace; and

a plurality of side surfaces extending between said inner and outer surfaces;

(b) suspension means extending over some portion of said outer surface of said block and having suspension arm means extending into said block, said suspension arm means having at least one aperture therein;

(c) support means mounted within said block and extending

through the at least one aperture in said suspension arm means;

(d) at least one of the above named block surfaces being arcuate, the curvature thereof generally conforming to that of the arcuate surface adjacent to which it is to be mounted.

4,429,505

FIXING DEVICE FOR FASTENING OBJECTS ON HOLLOW BOARDS

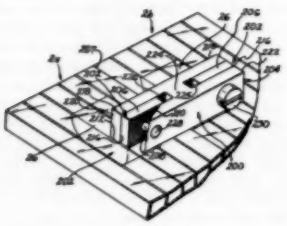
Artur Fischer, Weinhalde 34, D-7244 Waldachtal 3, Tumlingen, Fed. Rep. of Germany

Filed Sep. 8, 1981, Ser. No. 300,310

Claims priority, application Fed. Rep. of Germany, Sep. 11, 1980, 3034129; Oct. 23, 1980, 3039917; Nov. 8, 1980, 3042282

Int. Cl.³ E04C *1/16*

U.S. Cl. 52—583 **6 Claims**



1. A fixing device for connecting objects to a hollow board having a plurality of spaced cells defined by transversely spaced first and second panels which are joined to one another through a plurality of spaced webs therein between, the fixing device comprising: a connecting member for fastening objects thereto; at least one elongated support member for disposing within said boards said support member, said support member having first and second opposed ends and said connecting member being arranged substantially perpendicular to one of said opposed ends, wherein a pull-out force acting on said connecting member due to said objects supported thereby is substantially received by said supporting member when said device is disposed in said board; and a holding member having a web, a pair of parallel spaced elongated leg members extending from said web, said connecting member having a plate-like shape with a pair of parallel spaced slots therein, said slots being adapted to matingly receive said pair of leg members of the holding member therein.

4,429,506

INTERLOCKING BUILDING BLOCK

Eugene R. Henderson, 3502 The Alameda, Baltimore, Md. 21218

Filed Apr. 8, 1982, Ser. No. 366,729

Int. Cl.³ E04B *1/00*

U.S. Cl. 52—589 **6 Claims**

1. An interlocking block construction, comprising:

(a) a solid wide building block having a flat front face and a parallel flat matching aligned rear face extending parallel to and spaced from the front face,

(b) two identical rectangularly-shaped upwardly-extending upper flat faces extending rearwardly and perpendicular from the front face along each top edge,

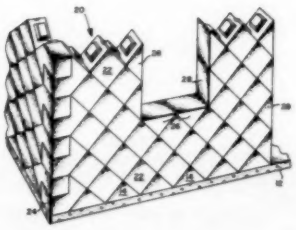
(c) the upper flat faces being angularly inclined toward each other and meeting along the line of intersection which forms an upper central peak extending rearwardly and perpendicular to the front face,

(d) each upper flat side face having a matching solid laterally thick block interlocking element approximately one-third the width of the block extending upwardly therefrom which is centrally located on the upper side face and accurately spaced from the front and rear faces as well as the upper peak of the block to provide solid lateral strength,

(e) each block interlocking element including two flat upwardly-facing inwardly inclined side pilot surfaces of the same width and length which extend parallel to the front face and are angularly inclined toward each other so as to provide centering and guide action,

(f) the block interlocking element having a flat top support face extending between the inclined pilot surfaces and parallel to the upper flat side face,

(g) the block interlocking element also including an upwardly facing stop face connecting the two separately engaging pilot surfaces and inclined at a slightly greater angle than 90° to the upper peak whereby a complementary surface of an adjacent block can be accurately guided into position and supported on the upper flat face,



(h) the vertically disposed front face has two equally downwardly inclined lower edges which meet at a central lower apex in direct vertical alignment with the upper apex,

(i) a flat lower side face extending rearwardly and perpendicular from the front face at each lower edge and angularly inclined toward each other meeting along a lower line of intersection extending rearwardly and perpendicular to the front face,

(j) each flat lower side face having a centrally disposed receiving cavity which complements the block interlocking element on the opposite side of the upper peak and identically spaced from the plain of the adjacent upper side face, and,

(k) the lower extending flat surface of each cavity being sufficiently spaced and inclined to permit vertical implacement of the block without contacting the lower most surface of the interlocking element on a lower course when the blocks are vertically assembled.

4,429,507

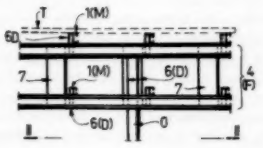
UNIVERSAL BUILDING FRAME

Zoltan Czenthe, Budapest, Hungary, assignor to Csongrad Megyei Tanacsi Epitoipari Vallalat, Hódmezövásárhely, Hungary

Continuation of Ser. No. 90,109, Nov. 1, 1979, which is a continuation of Ser. No. 944,795, Sep. 22, 1978, abandoned. This application Feb. 2, 1981, Ser. No. 232,401

Int. Cl.³ E04H *12/00*

U.S. Cl. 52—650 **11 Claims**



1. In a light-weight modular metallic frame for a building having vertical columns including column elements supporting

a substantially horizontal assembly of beam elements, the improvement wherein: each beam element is perforated and is channel-shaped in transverse cross-section;

the beam elements form a lattice of mutually parallel main beams and mutually parallel auxiliary beams non-coplanar with and perpendicular to the main beams;

the main beams are spaced apart by a predetermined horizontal distance corresponding to a first modular length;

each main beam comprises two beam elements in a parallel, spaced apart and back-to-back relationship and secured to a vertical column extending in the space between said elements;

the main beams are arranged in vertically spaced-apart parallel pairs to form double Vierendeel girders and;

each auxiliary beam comprises at least one beam element connected to a main beam;

the perforations in all of said beam elements are at a regular spacing which is an integral fraction of said first modular length; and

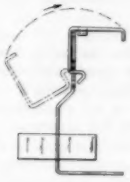
said double Vierendeel girders, said auxiliary beams, and said main and auxiliary beams are connected by channel-shaped perforated, upright elements extending perpendicularly to the main beams, with fastening elements passed through the perforations.

4,429,508

ANCHORING DEVICE FOR METAL ROOF

Charlie B. Sizemore, Rte. 10 Mesa Dr., Kingsport, Tenn. 37663

Filed Oct. 19, 1981, Ser. No. 312,691
Int. Cl.³ E04B *1/38*
U.S. Cl. 52—713 **6 Claims**



1. An anchoring device for slidably attaching a metal roof to a structured member comprising,

(A) A galvanized sheet metal stationary member comprised of a base portion and an upward depending portion attached to the base portion,

(1) the base portion having at least one hole therein adapted to secure the stationary member to the structural member,

(2) the upward depending portion oriented at an angle of approximately 90° to the base portion of the stationary member, the upward depending portion having therein a slot, the long axis of the slot residing in a plane parallel to the base portion of the stationary member, the top edge of the upward depending portion being parallel to the long axis of the slot, the top edge having a notch therein,

(B) A galvanized sheet metal slidable member adapted to be attached to a metal roof and slide on the stationary member, the slidable member being comprised of a top portion, a downward depending portion and an engaging portion,

(1) the top portion having a downward depending punched projection adapted to allow the slidable member to slide along the top edge of the upward depending portion of the stationary member by positioning the upward depending portion in juxtaposition to the downward depending portion of the slidable member, the projection being of size and shape to pass through the notch in the top edge of the upward depending portion of the stationary member,

(2) the downward depending portion attached to the top portion at an angle of approximately 90°,

(3) an engaging portion attached to the lower edge of the downward depending portion, the engaging portion having a length substantially less than the length of the slot, the engaging portion comprised of,

(a) a first piece oriented approximately 90° from the downward depending portion and projecting away from the plane in which the downward depending portion resides so as to be on the same side of the plane as the top portion,

(b) a second piece attached to the first piece and depending toward the plane in which the downward depending portion resides, the width of the second piece being sufficient to position the edge of the second piece in slidable engagement with the upper depending portion of the stationary member and also sufficient to position the downward depending portion of the slidable member and the upward depending member of the stationary member in parallel relationship and in juxtaposition,

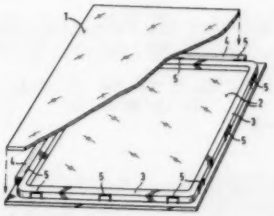
wherein the notch in the top edge of the upward depending portion of the stationary member is positioned such that the downward depending punched projection of the top portion of the slidable member passes through the notch when the engaging portion of the slidable member is positioned at the end of the slot.

4,429,509

MULTIPLE GLASS PANE WITH IMPROVED JOINTS OF PLASTIC MATERIALS

Joël Vachet, St. Germain du Plain; Justin Bruandet, Chalon sur Saone, and Jacques Fremeaux, Bougival, all of France, assignors to Saint-Gobain Vitrage, Courbevoie, France

Filed Mar. 8, 1982, Ser. No. 355,480
Claims priority, application France, Mar. 10, 1981, 81 04706
Int. Cl.³ E06B *3/24*
U.S. Cl. 52—788 **17 Claims**



1. A multiple glass pane consisting of glass sheets held together at a certain distance from each other by joints of plastic materials, comprising spacer pieces of a height equal to the distance between the glass sheets, inserted between the glass sheets and embedded in the joints, characterized in that each spacer piece is a piece practically without thickness, of small length compared to the dimensions of the glass pane and deformable in the direction of its height by a load of not more than 3 kg.

4,429,510

DEVICE FOR SHAPING A FILM OF HEAT-RETRACTABLE PLASTICS MATERIAL

Jacques Thimon, Tresserve, France, assignor to S.A. Thimon, Aix-les-Bains, France

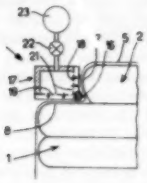
Filed May 5, 1981, Ser. No. 260,727
Claims priority, application France, May 6, 1980, 80 10066
Int. Cl.³ B65B *53/02*
U.S. Cl. 53—167 **5 Claims**

1. In a device for shaping a film of heat-retractable plastics

material in the zone of the lateral spaces of a pallet-less, multi-layer load having a layer of smaller area than the area of the adjoining layer thereby forming spaces around said smaller layer defined by the faces of right-angled dihedrons including an angle therebetween with vertical and horizontal faces, comprising:

mobile shaping elements to be applied against said film of heated and soft plastic material covering the faces of each dihedron defining said spaces for gripping while said film is soft;

each shaping element consisting of a shaper bar having a periphery dimensioned to fit at least partially in said angle



and forming part of a box-like chamber for blowing cool air, the shaper bar being disposed along the edge of said chamber facing the angle of the dihedron and said chamber having vertical and horizontal air-permeable faces which are adjacent the shaper bar extending respectively opposite the faces of the dihedron, the interior of said chamber being connected, via a valve, to a source of air under pressure; and

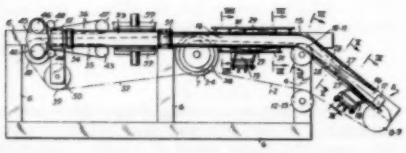
means for displacing each shaper bar in the direction of the vertical and horizontal faces of said dihedron, to engage said bar with the film in the angle of the dihedron between said smaller layer and said adjoining layer of said load.

4,429,511

FINISHING DEVICE FOR PACKAGING CONTAINERS

Bruno Paoli, Fornacette, Italy, assignor to International Paper Company, New York, N.Y.

Filed Sep. 15, 1981, Ser. No. 302,392
Int. Cl.³ B65B *7/04*
U.S. Cl. 53—379 **7 Claims**



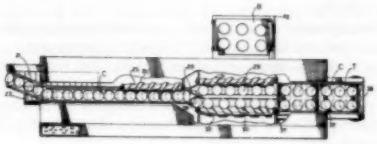
1. A device for the finishing of filled and sealed packaging containers which are at least approximately of parallelepipedal shape and having the usual four protruding terminal flaps, comprising moving means for producing continuous movement along a sliding track of the containers which are received in a cadenced manner from a feed source, the sliding track includes an upper plate and a lower plate spaced apart from said upper plate, a plurality of stationary weakening and bending elements of said flaps of the containers, disposed in series along a portion of said track, said elements being attached in opposite positions parallel to each other, the positions being located at respectively the lower plate and the upper plate, said elements bending the flaps of each container from their horizontal position, first in one direction and then in the opposite direction with a consequent effect of weakening their base, thereafter folding them against the upper and lower surfaces of the container and means for attaching said flaps to the sides of the container.

4,429,512

TRAY-LOADING MACHINE

Alexander A. Pegon, Jr., Norristown, Pa., assignor to Diversified Eastern, Inc., Trexlertown, Pa.

Filed Jan. 23, 1981, Ser. No. 227,582
Int. Cl.³ B65B *35/44, 35/46*
U.S. Cl. 53—534 **10 Claims**



1. An apparatus for loading containers into a carrier tray having individual rows of cutouts for receiving the containers comprising:

infeed means for introducing a flow of containers into the apparatus;

feed-control means for receiving the flow of containers, for spacing the containers at a uniform predetermined distance from each other within a flow line and for discharging the spaced containers;

at least first and second parallel feed lines downstream from said feed-control means;

gate means for sequentially directing containers discharged from the feed-control means to either said first or said second feed lines;

said first feed line including a first feed-control screw and said second feed line including a second feed-control screw, the first and second feed-control screws having different pitches and cooperating to advance the containers in each feed line so that a container is discharged from the end of each feed line simultaneously, the discharged containers being laterally aligned in a transverse row;

container conveyor means for receiving and advancing the aligned row of containers discharged from the first and second feed lines; and

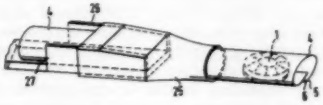
tray conveyor means underlying the container conveyor means for receiving and conveying carrier trays, said tray conveyor means being synchronized with said container conveyor means whereby each of said aligned rows of containers reach the discharge end of said container conveyor means simultaneously with a row of cutouts in a tray so that the row of containers fall downwardly directly into said row of cutouts in said tray.

4,429,513

APPARATUS FOR ENCLOSING OBJECTS

Hans Beckers, Monchen-Gladbach, and Klaus Vollmer, Viersen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jul. 21, 1981, Ser. No. 285,682
Claims priority, application Fed. Rep. of Germany, Aug. 16, 1980, 3030915
Int. Cl.³ B65B *9/06*
U.S. Cl. 53—547 **3 Claims**



1. In an improved apparatus for enclosing solid objects with

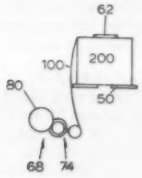
a sheet of packaging material into a tight wrapping including means for feeding the solid objects to be wrapped in an evenly spaced manner to an input end of a tube forming and guiding means for dispensing a flexible packaging material from a supply reel into said tube forming and guiding means which shapes the flexible packaging material into a tube surrounding said solid objects and carries said solid objects to an outlet end of said tube forming and guiding means, means for cutting the shaped tube formed about the solid objects into uniform lengths, and means for twisting the ends of the cut shaped tubes to securely enclose the solid objects with the tube, the improvement comprising a collar of elastic material secured to and surrounding an output end of said tube forming and guiding means through which said solid objects enclosed in a formed tube of packaging material passes, said collar of elastic material has a smaller cross section than the cross section of said solid objects and surrounds the wrapped objects as they pass through so that said tube of packaging material is formed to tightly fit around said solid objects as said solid objects leave the output end of said collar of elastic material.

4,429,514

ROTATABLE STRETCHING APPARATUS WITH PRESTRETCHING MECHANISM

William G. Lancaster, Louisville, and Patrick R. Lancaster, III, Anchorage, both of Ky., assignors to Lantech, Inc., Louisville, Ky.

Continuation-in-part of Ser. No. 96,384, Nov. 21, 1979, Pat. No. 4,302,920. This application Apr. 15, 1981, Ser. No. 254,415
The portion of the term of this patent subsequent to Dec. 1, 1998, has been disclaimed.
Int. Cl.³ B65B *11/02*
U.S. Cl. 53—556 **33 Claims**



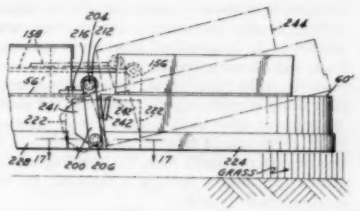
1. Apparatus for making a unitary package using a single web of stretchable plastic film material to form an overwrap comprising a frame, a load support means and a film dispensing means connected to said frame, said film dispenser means being adapted to hold a film roll and said load support means being adapted to hold a load, means to provide relative rotational movement between said load support means and said film dispenser means causing a film web to be pulled downstream from the film roll and wrapped around a load placed on said load support means, and film stretching means engaging said film web from said film roll upstream of said load support means; said film stretching means being driven by engagement of said film web moving downstream and comprising means to hold two roller assemblies adjacent each other, each roller assembly comprising bearing means and a roller member mounted to said bearing means, one of said roller assemblies being positioned upstream from the other roller assembly and including a drive roller member mounted to rotate coaxially with said upstream roller, said drive roller member having a circular cross-section and an outer surface which engages a surface of the downstream roller assembly to drive the upstream roller at a lesser speed than the rotational speed of the downstream roller so that the film web is stretched before it passes the downstream roller assembly.

4,429,515

SELF PROPELLED LAWN MOWER

Robert D. Davis, Jr., 627 Andrew, Jackson, Mich. 49202, and James S. Schucker, 54 Massoit, Clawson, Mich. 48017

Continuation-in-part of Ser. No. 229,200, Jan. 28, 1981. This application Dec. 11, 1981, Ser. No. 329,769
Int. Cl.³ A01D *35/26*
U.S. Cl. 56—6 **14 Claims**



1. An improved mower deck for attachment to a tractor comprising a central deck, at least one wing deck attached to the central deck, a plurality of vertically mounted blade spindles in the mower deck each rotatably supporting a cutting blade, at least one of said spindles being in the wing deck,

a pair of links attaching the wing deck to the central deck, one end of each link being pivotably attached to the central deck and the other end of each link being pivotably attached to the wing deck,

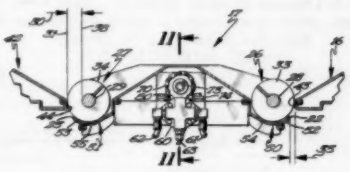
stop means to limit upward angular rotation of the wing deck about the pivotal attachments to the wing deck, said stop means located substantially below the axis of the pivotal attachments to the central deck, said stop means disengageable upon movement of the wing deck above and over the central deck.

4,429,516

MULTI-ROW CROP HARVESTING ATTACHMENT

Leland E. Erickson, Forman, N. Dak. 58032

Filed Oct. 14, 1981, Ser. No. 311,459
Int. Cl.³ A01D *45/00, 57/22*
U.S. Cl. 56—95 **20 Claims**



1. A multi-row crop harvesting attachment for use in combination with a combine, comprising:

(1) a main frame for traversing in a longitudinal direction of movement a field having a rowcrop;

(2) two or more drive sections, mounted on said main frame and aligned transversely to the longitudinal direction of movement of the frame, each drive section comprising: a guide edge located at each of the outer transverse boundaries of the drive section, each guide presenting a smooth outer surface parallel to the longitudinal direction of movement of the frame and allowing rearward longitudinal movement of rowcrop stalks thereagainst; an auger, having a shaft and flighting, located near and associated with each of the guide edges of the drive section, each auger having a flighting reach at least as great as the thickness of rowcrop stalks, the outer boundary of each auger's flighting extending transversely outward beyond said associated guide edge by a distance greater than said

thickness of rowcrop stalks and the outer boundary of each auger's shaft extending no further outward than the guide edge with which it is associated; journal means coupled with each end of said augers for facilitating rotation of the augers; and drive means for rotating the augers so as to cause rowcrop stalks to move rearward;

(3) one or more platform sections, each platform section mounted on said main frame between two drive sections and aligned with said drive sections transversely, each platform section comprising a guide edge located at each of the outer transverse boundaries of the platform section, each guide edge presenting a smooth outer surface being parallel to the longitudinal direction of movement of the frame and allowing longitudinally rearward movement of rowcrop stalks thereagainst, each platform section guide edge being in substantial opposition to the guide edge of the adjacent drive section, each fo said platform section guide edges spaced transversely substantially the thickness of rowcrop stalks from the opposing drive section's guide edge, thereby forming a flightway for rearwardly moving rowcrop stalks;

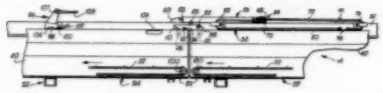
(4) two divider sections, one divider section mounted on said main frame adjacent to and aligned transversely with a drive section having a guide edge not in opposition to any platform section's guide edge, and the other divider section mounted on said main frame adjacent to and aligned transversely with the other drive section having a guide edge not in opposition to any platform section's guide edge, each divider section comprising a guide edge located at one of its outer transverse boundaries, said guide edge presenting a smooth outer surface being parallel to the longitudinal direction of movement of the frame and allowing longitudinally rearward movement of rowcrop stalks thereagainst, each divider section's guide edge being in substantial opposition to the guide of said respective adjacent drive section, said divider section's guide edge spaced transversely approximately the thickness of rowcrop stalks from the respective opposing drive section's guide edge, thereby forming a flightway for rearwardly moving rowcrop stalks.

4,429,517

HARVESTING HEADER WITH ADJUSTABLE DRAPER FOR LEFT, RIGHT OR CENTER DELIVERY

Howard R. Lohrentz, Hesston, and Cecil L. Case, Newton, both of Kans., assignors to Hesston Corporation, Hesston, Kans.

Filed Oct. 6, 1981, Ser. No. 309,081
Int. Cl.³ A01D *35/14, 57/20*
U.S. Cl. 56—181 **9 Claims**



1. In a harvesting header having a pair of transverse crop conveyor sections shiftable laterally in opposite directions relative to a frame of the header between cooperating positions for alternative left, right and center delivery of crops severed by the header during advancement thereof, the improvement comprising:

a shifter operably coupled with one of said sections for effecting said lateral shifting thereof;

a releasable latch connecting the other of said sections with said one section for causing conjoint lateral shifting of both sections as a unit when said one section is operated by the shifter; and

means for selectively releasing said latch to permit individual shifting of the one section by said shifter as said other section remains stationary,

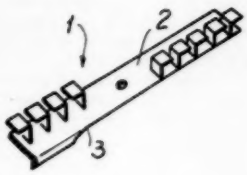
said other section having no means for shifting the same in either lateral direction except when coupled with said one section by said latch.

4,429,518

BLADE STRUCTURE, PARTICULARLY FOR ROTATING GRASS SHAVING MACHINES

Luisa Fedeli, Via del Gracchi, 26, 20100 Milano, Italy

Continuation of Ser. No. 334,369, Dec. 24, 1981, abandoned. This application Mar. 18, 1983, Ser. No. 476,397
Claims priority, application Italy, Jan. 14, 1981, 19124 A/81
Int. Cl.³ A01D *55/18*
U.S. Cl. 56—295 **5 Claims**



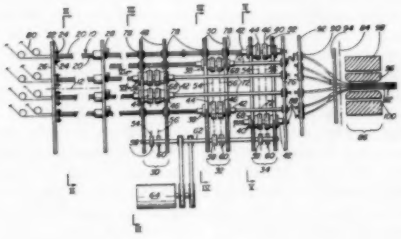
1. In a lawn mower which comprises a blade structure comprising an elongated body, rotating about an axis substantially perpendicular to the ground and provided, at the operative edges thereof, with cutting members for cutting grass, a container for collecting the cut grass, and at the edges opposite to said operative edges, a plurality of lugs, the improvement wherein said lugs consist of a combination assembly of first parallel, vertically extending, unsharpened portions extending perpendicularly to the plane of rotation of the blade and coplanar, horizontally extending portions connected to said first portions extending parallely to the plane of rotation of said blade and coplanar with respect to each other, said lugs directing the chopped grass into said container.

4,429,519

FORMING CABLE CORE UNITS

John N. Garner, Kingston; Jean M. Roberge, Pointe Claire, and Oleg Axiuk, Pinecourt, all of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Aug. 30, 1982, Ser. No. 413,175
Int. Cl.³ H01B *13/04*
U.S. Cl. 57—293 **10 Claims**



1. Apparatus for forming a cable core unit from a plurality of wire units each of at least two stranded together wires comprising:

a plurality of wire guide means, each for the wires of one of the units, each guide means having a longitudinal axis extending in a wire pass direction, being rotationally flexible, and defining individual feedpaths for the two wires of its unit to maintain the wires separate as they proceed to one of at least a first and second twisting stations disposed

downstream of the guide means with a second twisting station downstream of the first station;

each guide means terminating at its respective station in a twisting means which is rotatable at its station around the feedpaths of the guide means to effect a rotational twist to the guide means and thus of the feedpaths around the axis;

rotating means to rotate the twisting means in each station and effect rotational twisting of each guide means and its feedpaths for a plurality of revolutions about its axis alternately in one direction and then in the other to introduce and impose an alternating twist in the wires and hold the wires separate as they move towards the twisting means;

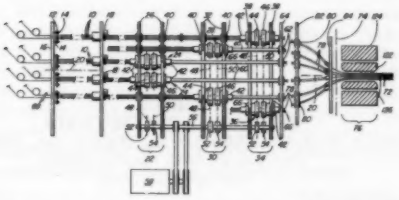
a stranding station downstream of the twisting stations with at least a section of the feedpaths for wires of some wire units being curved and of fixed orientation between each twisting station and the stranding station to cause convergence of the feedpaths of wires for each wire unit with the wires for other wire units as they approach the stranding station and to enable the wire units to combine together to form the cable core unit; and

separation tube means to prevent the wires for each wire unit from stranding together before they reach the stranding station, said separation tube means being rotatable with the twisting means and extending in curved configuration along the curved feedpath sections, with flexibility to enable the tube means to be maintained in its curved configuration along said fixed path section during rotation of the tube means in said alternating directions and with torsional rigidity to avoid build-up and retention of twist.

4,429,520
APPARATUS FOR STRANDING AT LEAST TWO WIRES TOGETHER

John N. Garner, Kingston, and Jean M. Roberge, Pointe Claire, both of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Aug. 30, 1982, Ser. No. 413,176
Int. Cl.³ H01B *13/04*
U.S. Cl. 57—293 **9 Claims**



1. Apparatus for stranding a unit of at least two wires together comprising:

wire guide means extending in a wire pass direction, downstream to a twisting station to define individual feed paths for wires and prevent the wires from twisting together as they move along the guide means to the twisting station, the guide means being rotatably flexible about a longitudinal axis to provide torsional twist in the guide means;

a twisting means in the twisting station and connected to the wire guide means, the twisting means having means to rotate it alternately, in one direction and then the other and for a plurality of revolutions, to rotate the guide means at the twisting station and place torsional twist in the guide means alternately in one direction and then the other about said longitudinal axis;

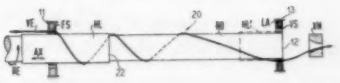
a stranding means in a stranding station downstream along the feedpaths from the twisting station with at least a section of the feedpaths for wires being curved and of fixed orientation between the twisting and stranding stations; and

means extending between the twisting and stranding stations to prevent the wires, after passage through the twisting means, from stranding together before they reach the stranding station, said strand prevention means comprising a wire separation tube which is curved to extend along the fixed curved section of path and defines the individual feed paths for the wires, said separation tube being rotatable around an axis of rotation which coincides with the fixed curved path section and with a speed and direction of rotation the same as the twisting means, and the tube having flexibility to enable the tube to be maintained in its curved configuration along said fixed curved path section and torsional rigidity to avoid build-up and retention of twist.

4,429,521
DEVICE FOR SZ-STRANDING BY USING A TUBE STORE

Ulrich Oestreich, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed May 14, 1982, Ser. No. 378,423
Claims priority, application Fed. Rep. of Germany, Jun. 5, 1981, 3122473
Int. Cl.³ D07B *3/00, 7/00*
U.S. Cl. 57—294 **13 Claims**



1. In a device for SZ-stranding, said device including means for guiding and storing elements being SZ stranded, said means including a tube store having a stranding surface and being mounted in a frame for rotation on its axis, at least one stranding disk associated with said tube store and means for rotating said tube and disk in a reversing fashion, the improvements comprising sleeve means being disposed to extend over and cover a portion of the stranding surface of said tube store and support means for mounting said sleeve means in the frame so that it does not rotate at the same speed as the tube store.

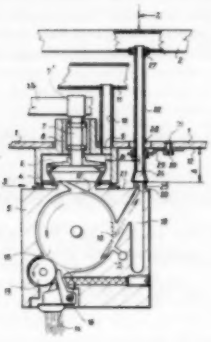
4,429,522
OPEN-END SPINNING MACHINE

Frantisek Ferkl; Antonin Cap; Milos Vecera; Josef Skala; Vaclav Kopriva; Michal Blasko, all of Usti nad Orlici; Karel Pavek, Hnatnice; Milan Chrtek, Ceska Trebova, and Jan Blasko, Usti nad Orlici, all of Czechoslovakia, assignors to Vyzkumny ustav bavinarsky, Usti nad Orlici, Czechoslovakia

Filed Mar. 17, 1982, Ser. No. 358,887
Claims priority, application Czechoslovakia, Apr. 13, 1981, 2773-81
Int. Cl.³ D01H *7/888*
U.S. Cl. 57—301 **4 Claims**

1. In an open-end spinning machine having a frame, a central air withdrawing duct disposed on one side of the frame, a plurality of spinning units disposed on the other side of the frame, each spinning unit having a spinning housing with a spinning rotor and a technological air withdrawing aperture, and a fiber separating housing with a sliver opening cylinder and an associated cleaning aperture with an impurity withdrawing duct the outlet of which communicates via a connecting tube with the central air withdrawing duct, the improvement wherein the outlet of the impurity withdrawing duct extends toward the outer wall of the fiber separating housing and has an inner height dimension substantially corresponding to the inner height dimension of the cleaning aperture, said latter height dimension being given by the width of the sliver opening cylinder, the connecting tube having a conically flared inlet facing the outlet of the impurity withdrawing duct in the outer wall of the fiber separating housing and having in

the plane of the inlet of the connecting tube a larger inner cross-section than the outer cross-section of the outlet of the impurity withdrawing duct, there being provided a gap for additionally sucking in air between said inlet of the connecting tube and the outlet, the end plane of the outlet of said impurity withdrawing duct on the fiber separating housing being spaced a distance from the plane in which the operating air withdraw-



ing aperture lies in the spinning housing which is larger than the axial spacing between said outlet and said aperture, whereby to prevent an unwanted interaction of air flows in the opened and inoperative condition of the spinning unit and to insure a continuous withdrawal of impurities from the cleaning aperture of the fiber separating housing into the central air withdrawing duct.

4,429,523

PROCESS FOR MAKING FASCIATED SPUN YARN

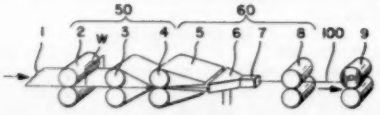
Koji Kajita, Omihachiman; Takashi Nakayama, and Seiichi Yamagata, both of Otsu, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Jul. 7, 1982, Ser. No. 396,063

Claims priority, application Japan, Jul. 8, 1981, 56-105707

Int. Cl.³ D01H *5/28*; D02G *3/22*

U.S. Cl. 57—328 **6 Claims**



1. A process for making a fasciated spun yarn, wherein a bundle of fibers, drafted in a drafting zone having a pair of back rollers, a pair of second rollers and a pair of front rollers, is twisted and detwisted by false twisting means while being overfed between the pair of front rollers and a pair of delivery rollers, characterized in that the width W (mm) of said bundle of fibers measured just upstream of the nip point of a pair of second rollers of said drafting zone and a yarn count N (Nm) of said spun yarn are set to satisfy the following relationships:

$$60/\sqrt{N} \leqq W \leqq 170\sqrt{N}. \text{ and}$$

in that the overfeed ratio is set to be equal to or lower than 5%.

4,429,524

FALSE-TWIST DEVICE

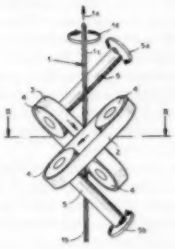
Manfred Kress, Sömmersdorf, Fed. Rep. of Germany, assignor to FAG Kugelfischer Georg Schäfer & Co., Schweinfurt, Fed. Rep. of Germany

Filed Mar. 23, 1982, Ser. No. 360,912

Claims priority, application Fed. Rep. of Germany, Mar. 28, 1981, 3112426; Mar. 28, 1981, 3148911

Int. Cl.³ D02G *1/04*

U.S. Cl. 57—336 **11 Claims**



2. A device for imparting a false twist to a yarn, comprising:

a pair of endless driven belts having crossing juxtaposed stretches with said yarn passing between said stretches at the crossing region; and

magnetic means for pressing said stretches of said belts against said yarn and toward one another in said region.

4,429,525

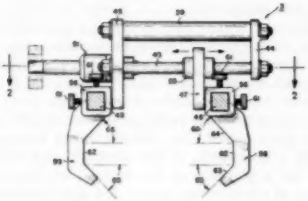
REPAIRING A ROLLER CHAIN

Ron K. Doak, 15021 Kimberley La., Houston, Tex. 77079

Filed Feb. 25, 1982, Ser. No. 352,493

Int. Cl.³ B21L *21/00*

U.S. Cl. 59—7 **7 Claims**



1. A method for applying tensioning forces to a roller chain, comprising:

mounting a separate yoke transversely across each one of two longitudinally-spaced portions of said chain for engaging the peripheral edges of the links thereof; and

reducing the distance between said yokes to thereby relax the portion of the chain disposed between said yokes.

4,429,526

SUSPENSION CHAIN HEAD FOR MECHANICALLY ASSEMBLED SLING CHAIN SYSTEMS

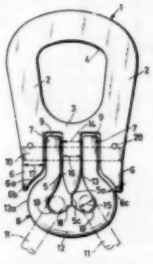
Friedhelm Rehbein, Menden-Oesbern, Fed. Rep. of Germany, assignor to Firma August Thiele, Iserlohn-Kalthof, Fed. Rep. of Germany

Filed Dec. 10, 1981, Ser. No. 331,127

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1980, 3048863

Int. Cl.³ F16G *15/04*

U.S. Cl. 59—93 **13 Claims**



1. A suspension chain head for mechanically assembled sling chain systems, comprising a substantially U-shaped suspension member having two legs and a web having a central portion and two lateral fork portions arranged mirrorsymmetrical at opposite sides of said central portion so as to form two parallel slots therebetween; and a connecting member pivotably mounted on said web of said suspension member and arranged for receiving chains of a predetermined thickness, said connecting member having two legs received in said slots of said suspension member and a bracket connecting said legs of said connecting member with one another, said legs and said bracket of said connecting members being dimensioned corresponding to an inner width of a link of the chains to be suspended, said legs of said connecting member extending parallel to one another and inwardly so that said bracket is omega-shaped, said connecting member having a receiving opening having a width greater than the thickness of the chains to be suspended, said central portion of said web of said suspension member having a thickness at most equal to the thickness of the chains to be suspended, and said fork portions of said web of said suspension member having at least the thickness of said central portion of said web of said suspension member.

4,429,527

TURBINE ENGINE WITH COMBUSTOR PREMIX SYSTEM

J. Michael Teets, 12104 Gardenway G-7, Palm Beach Gardens, Fla. 33410

Filed Jun. 19, 1981, Ser. No. 275,157

Int. Cl.³ F02C *7/224*

U.S. Cl. 60—39.06 **17 Claims**

12. A method of combusting an air and fuel mixture in a turbine engine, comprising the steps of

atomizing the fuel,

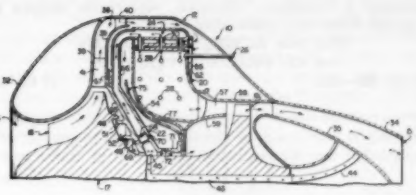
mixing compressed air with the atomized fuel,

passing the atomized fuel-compressed air mixture between a compressor and combustion chamber to cool the compressor,

vaporizing the fuel in the atomized fuel-compressed air mixture,

passing the vaporized fuel-compressed air mixture through tubes having ports in walls thereof,

passing additional compressed air through the ports,



mixing the additional compressed air with the vaporized fuel-compressed air mixture in the tubes, and

igniting the resultant mixture.

4,429,528

EMERGENCY FUEL SYSTEM

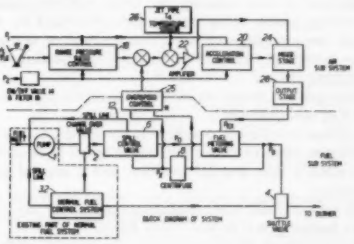
Robert B. Matthews, Chandler's Ford, and Guy E. Davies, Fareham, both of England, assignors to Plessey Overseas Limited, Ilford, England

Filed Jan. 22, 1981, Ser. No. 227,268

Claims priority, application United Kingdom, Jan. 22, 1980, 8002144

Int. Cl.³ F02C *9/28*

U.S. Cl. 60—39.281 **9 Claims**

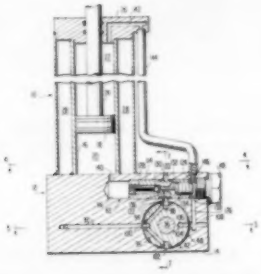


1. An emergency fuel control system for an aircraft engine, which emergency fuel control system includes means for supplying emergency fuel to the engine in an amount proportional to engine speed and compressure pressure ratio, said control system comprising: means for converting a pilot's throttle lever position into a demand compressor pressure ratio signal; means for sensing actual compressor inlet pressure and actual compressor outlet pressure; first fluidic means responsive to the pilot's throttle lever position and to said actual compressor inlet and outlet pressures, said first fluidic means for comparing actual compressor pressure ratio with demand compressor pressure ratio and providing an error signal as a fluidic control pressure; means providing fluidic sensor inputs corresponding to engine speed and jet pipe temperature for limiting engine performance; second fluidic means for computing actual compressor pressure ratio and for generating an output signal pressure as a particular function of engine compressor ratio; fluidic mixer means responsive to output signals from said first and second fluidic means to limit the output signal from said first fluidic means; and a fluidic output device which receives signals from the fluidic mixer means and which generates a signal which has substantially the same shape as the acceleration control signal but which is at a lower level and which is used to define the minimum amount of fuel that is safely required by the engine in order to maintain combustion.

4,429,529
HYDRAULIC CONTROL SYSTEM HAVING RECIPROCATING PUMP AND HANDLE OPERATED ROTATING VALVE

Lambertus J. Sonneborn, Oldenzaal, Netherlands, assignor to Applied Power Inc., Milwaukee, Wis.

Filed Nov. 20, 1981, Ser. No. 323,391
Int. Cl.³ F01B *29/08*; F15B *11/08*
U.S. Cl. 60—433 **12 Claims**



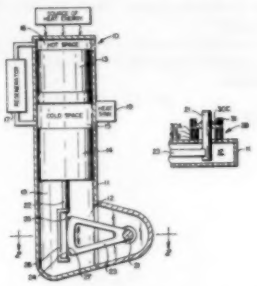
1. A compact rotating hydraulic drive comprising:
a housing;
a cam shaft in said housing for both linear translational and rotational movement;
at least one pumping cam mounted on said cam shaft;
at least one pumping unit comprising a pumping piston mounted in said housing for linear reciprocation, said pumping piston being operatively controlled by said at least one pumping cam such that rotation of said at least one pumping cam causes linear reciprocation of said pumping piston;
a valve spool mounted on said cam shaft but rotatable relative to said cam shaft;
first means selectively operable upon linear translation of said cam shaft to rotate said valve spool back and forth between a first angular position and a second angular position;
a first path of fluid communication connecting said at least one pumping unit to said valve spool;
a second path of fluid communication in said valve spool connecting said first path of fluid communication to a load when said valve spool is in its first angular position;
a third path of fluid communication in said valve spool connecting said first path of fluid communication to a load when said valve spool is in its second angular position; and
a fourth path of fluid communication in said valve spool for returning hydraulic fluid to tank when said valve spool is in its first or second angular position.

4,429,530
HERMETICALLY SEALED TRANSMISSION SYSTEM FOR A FREE PISTON STIRLING ENGINE

William T. Beale, Athens, Ohio, assignor to Sunpower, Inc., Athens, Ohio

Filed Feb. 3, 1982, Ser. No. 345,312
Int. Cl.³ F02G *1/04*
U.S. Cl. 60—520 **11 Claims**

1. In a free piston Stirling cycle engine provided with a housing that defines a gas-containing chamber variably partitioned by a displacer and a linearly reciprocative power piston, said power piston being accessible from a position outside said gas-containing chamber through a passageway formed in said housing, that improvement which comprises:
(a) a drive shaft extending through said passageway and mounted for rotationally reciprocative movement around its longitudinal axis;
(b) means located within the housing for transmitting mechanical energy between said power piston and said drive shaft; and
(c) a torsionally flexible seal surrounding a portion of said

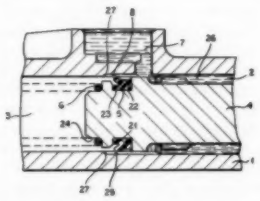


drive shaft and including an intermediate layer of reinforcing material bonded to relatively opposing layers of elastic material to form a gas-tight barrier between said drive shaft and said housing.

4,429,531
MASTER CYLINDER FOR BRAKE OR CLUTCH

Norbert Spielmann, Ebern, Fed. Rep. of Germany, assignor to FAG Kugelfischer Georg Schäfer & Co., Schweinfurt, Fed. Rep. of Germany

Filed Mar. 22, 1982, Ser. No. 360,649
Claims priority, application Fed. Rep. of Germany, Mar. 24, 1981, 3111411
Int. Cl.³ B60T *11/22*
U.S. Cl. 60—588 **9 Claims**



1. An actuating cylinder for a hydraulic device, comprising:
a cylinder body formed with a slightly stepped cylinder bore having a large diameter step and a small diameter step, the small diameter step being connectable to a device to be actuated;
means including an equalization port and a fluid resezrvoir opening laterally into said bore;
a piston axially shiftable in said bore and formed with a seal engaging the wall of said bore, said wall being formed with at least one groove reaching from said large diameter step into said small diameter step past said seal in a rest position of said piston.

4,429,532
APPARATUS AND METHOD FOR TEMPORARILY CONVERTING A TURBOCHARGED ENGINE TO A COMPRESSOR

Stanislav Jakuba, West Hartford, Conn., assignor to The Jacobs Manufacturing Company, Bloomfield, Conn.

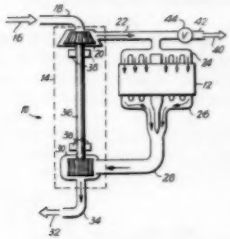
Filed Apr. 21, 1981, Ser. No. 256,093
Int. Cl.³ F02B *37/00*
U.S. Cl. 60—600 **8 Claims**

1. Apparatus for providing compressed air from a turbocharged internal combustion engine of a stationary vehicle,

said engine being of the compression ignition type and having a plurality of cylinders and intake and discharge manifolds; said apparatus comprising:

(a) a compression release engine brake connected to at least one of the engine cylinders;

(b) means for temporarily activating the compression release engine brake on some of the engine cylinders to load the



engine, thereby to increase the flow of fresh air into the turbocharger over and above that required for engine operation;

(c) means for temporarily reducing the flow of fuel to the braked cylinders; and

(d) means for withdrawing from the turbocharger-intake manifold fluid circuit at least some of the excess air compressed by the turbocharger.

4,429,533

SUPERCHARGED INTERNAL COMBUSTION ENGINE WITH TWO CONTROLLABLE EXHAUST GAS TURBOCHARGERS

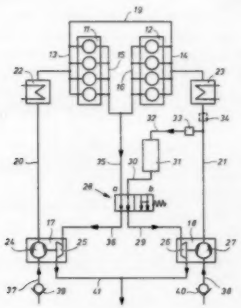
Hans Dinger, Friedrichshafen, Fed. Rep. of Germany, assignor to MTU-Motoren- und Turbinen-Union Friedrichshafen GmbH, Friedrichshafen, Fed. Rep. of Germany

Filed Jul. 6, 1981, Ser. No. 280,201

Claims priority, application Fed. Rep. of Germany, Dec. 12, 1980, 3046874

Int. Cl.³ F02B *37/00*

U.S. Cl. 60—606 **10 Claims**



1. An internal combustion engine comprising means for providing a supply of supercharging air for the engine, and an auxiliary combustion chamber means for improving the acceleration characteristic of the engine, characterized in that the means providing a supply of supercharging air includes at least two exhaust gas turbocharger means, each of the turbocharger means includes a compressor means and a turbine means, each of the compressor means is provided with an intake means, a check valve means being arranged in each of the intake means, means for supplying all of the exhaust gases from the engine to only one of the turbocharger means during an idling or partial load operation of the engine so that the compressor means of said one of the turbocharger means produces an air stream for effecting an automatic closing of the check valve means in the intake means of the other of said turbocharger means, means for enabling the auxiliary combustion chamber means to operate at full load during an acceleration of the engine, means for supplying exhaust gases from the auxiliary combustion chamber means to said other of said turbocharger means so as to enable the same to fully take over the supply of air to the auxiliary combustion chamber means and the engine, with the air produced by the compressor means of said other of a turbocharger means automatically effecting a closing of the check valve means in the intake means of said one turbocharger means.

4,429,534

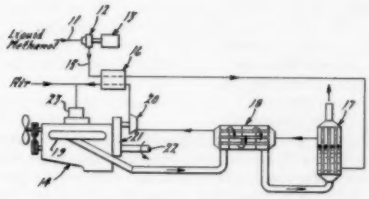
METHANOL FUELED SPARK IGNITION ENGINE

John R. Joy, Brighton, Mich., assignor to Williams International Corporation, Walled Lake, Mich.

Filed Jul. 26, 1982, Ser. No. 401,823

Int. Cl.³ F01K *23/14*

U.S. Cl. 60—618 **1 Claim**



1. A methanol fueled spark ignition engine comprising,

a liquid methanol supply line,

a liquid methanol fuel pump in said line for pressurizing the methanol therein,

a heat exchanger having a liquid fuel inlet connected to the outlet from said pump and a liquid fuel outlet,

a vapor generator having a liquid fuel inlet connected to the fuel outlet of said heat exchanger and a vapor outlet,

a catalytic reactor for decomposing methanol vapor to hydrogen and carbon monoxide having a methanol vapor inlet connected to the outlet of said vapor generator and a decomposed methanol vapor outlet,

an expander connected to the outlet of said catalytic reactor,

a spark ignition engine having an output shaft and an exhaust system, said exhaust system leading from said spark ignition engine to said catalytic reactor thence to said vapor generator whereby liquid methanol leaving said heat exchanger will be further heated and vaporized in said vapor generator and additionally heated and decomposed in said catalytic reactor to form hydrogen and carbon dioxide,

a carburetor for said spark ignition engine having an inlet for the induction of air and decomposed methanol vapor and

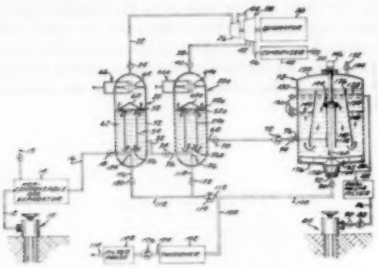
a conduit leading from the outlet of said expander to said heat exchanger thence to the inlet of said carburetor whereby air will be mixed with said hydrogen and carbon dioxide for induction into said spark ignition engine to support combustion therein,

said expander having an output shaft coupled to the output shaft of said spark ignition engine.

4,429,535
GEOTHERMAL PLANT SILICA CONTROL SYSTEM

John L. Featherstone, El Centro, Calif., assignor to Magma Power Company, Los Angeles, Calif.

Filed Aug. 13, 1980, Ser. No. 177,632
Int. Cl.³ F03G 7/00
U.S. Cl. 60—641.5 12 Claims



1. The method of reducing silica scaling in a geothermal energy system which has a geothermal brine flow path comprising a production well providing a flow stream of high temperature, high dissolved silica content geothermal brine and heat extraction means, which comprises:

establishing a zone in said heat extraction means in which said geothermal brine stream undergoes a substantial decrease in temperature,

continuously introducing into said zone the geothermal brine flow stream from said production well,

continuously flashing a portion of said geothermal brine stream into steam and removing such steam for power generating purposes,

providing particulate material capable of seeding silica precipitation thereon,

introducing said particulate material into said zone so as to seed the precipitation of dissolved silica from said brine, whereby silica which precipitates in said zone will be primarily in suspended, particulate form rather than in the form of scaling.

said zone being of sufficiently large cross-section to slow down the flow rate of said geothermal brine stream as said stream passes through said zone so as to allow sufficient time for the silica precipitation reaction to occur,

circulating an unflashed portion of said geothermal brine stream through said zone a plurality of times under thermal power provided by the effects of said flashing, and

combining the geothermal brine stream so circulated with the continuous geothermal brine flow stream being introduced into said zone.

4,429,536
LIQUEFIED NATURAL GAS-REFRIGERANT ELECTRICITY GENERATING SYSTEM

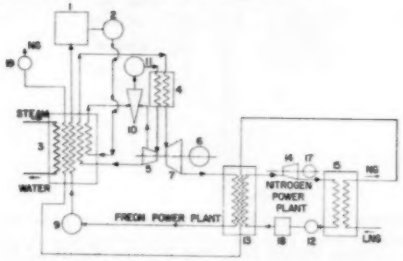
Reikichi Nozawa, To-7-204, Tamagawa Jyutaku, Somechi, Chohfu-shi, 182, Japan

Continuation-in-part of Ser. No. 973,735, Dec. 28, 1978, Pat. No. 4,330,998. This application Nov. 23, 1961, Ser. No. 323,509
Claims priority, application Japan, Dec. 29, 1977, 52-159500
Int. Cl.³ F01K 23/04
U.S. Cl. 60—655 17 Claims

1. A method for generating power and for gasifying a liquefied gas, the method including the steps of

circulating a refrigerant as a working fluid in a closed circuit through a storage tank, a compressor, heating means including a first heat exchanger, a high pressure gas turbine, reheating means, a low pressure gas turbine, a second heat exchanger, a pump, and a heater, said second heat exchanger condensing the working fluid and gasifying said liquefied gas, said first heat exchanger absorbing exhaust heat from an industrial plant and heating both the working fluid and the gasified product of said liquefied gas, said gas turbines serving to extract mechanical power from the working fluid and being connected with electrical generators to produce electric power,

the method also including the steps of conducting said liquefied gas and its produced gas in an open circuit through said second heat exchanger, said first heat exchanger and a pump withdrawing the produced gas,

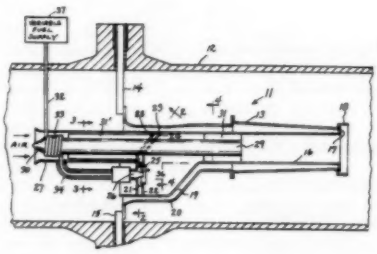


the method being characterized in that the working fluid has its critical temperature above the temperature of the exhaust gas of said industrial plant and has its freezing point below the entrance temperature of said liquefied gas in said second heat exchanger, and in that the working fluid in the circuit is maintained to experience temperatures well below the temperature of its substantial decomposition even in the presence of oil, water, iron and copper.

4,429,537
HEAT PIPES TO REDUCE ENGINE EXHAUST EMISSIONS

Donald F. Schultz, Middleburg Heights, Ohio, assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jan. 30, 1981, Ser. No. 229,693
Int. Cl.³ F23R 3/32; F02C 7/10
U.S. Cl. 60—730 9 Claims



1. A combustor comprising casing means having an air receiving conduit open adjacent one end portion of the casing means to receive air, said casing means having an opposite exit end portion and having an intermediate combustion space, heat pipe means mounted longitudinally in said casing means and being positioned at the radial outermost region of and extending alongside said combustion space for inhibiting quenching of combustion gases, said heat pipe means being arranged in heat-transmitting relationship with said conduit for preheating incoming air, means to guide the heated air into said combustion space, fuel discharge nozzle means radially disposed from said heat pipe and mounted in said combustion space, fuel

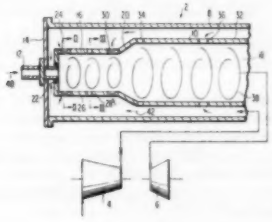
supply means, and fuel conduit means connecting said supply means to said nozzle means and including heat transfer means in heat-transmitting relationship with the heat pipe means for preheating the fuel, said heat transfer means comprises a coiled portion of said fuel conduit means engaged on said heat pipe means whereby the fuel and air are heated separately before being mixed.

4,429,538

GAS TURBINE COMBUSTOR

Isao Sato; Yohji Ishibashi; Yoshimitsu Minakawa; Takashi Ohmori; Zensuke Tamura; Yoshihiro Uchiyama, and Ryoichiro Ohshima, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 12, 1981, Ser. No. 234,015
Claims priority, application Japan, Mar. 5, 1980, 55-26630
Int. Cl.³ F02C *3/14*
U.S. Cl. 60—748 **21 Claims**



1. A gas turbine combustor comprising:

a combustion inner-pipe means for defining a head combustion chamber means and a rear combustion chamber means having a diameter larger than a diameter of the head combustion chamber means,

a combustor outer-pipe means for covering said combustor inner-pipe means,

fuel nozzle means disposed at an end part of the head combustion chamber means for supplying fuel to said combustion inner-pipe means,

a first group of port means disposed at the end part of the head combustion chamber means around said fuel nozzle means for feeding air into said combustor inner-pipe means, said first group of port means being disposed such that air entering through said port means has a component of velocity directed axially of the combustor inner pipe means,

a second group of port means disposed in a side wall of said head combustion chamber means at a position near said fuel nozzle means for feeding air into said combustor inner-pipe means,

a third group of port means disposed in the side wall of the head combustion chamber means at a position near to the rear combustion chamber means for feeding air into said combustor inner-pipe means, and

a fourth group of port means disposed in the side wall of the head combustion chamber means at a position intermediate of said second and third groups of port means for feeding air into said combustion inner-pipe means,

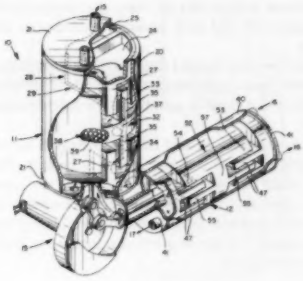
the second, third and fourth groups of port means all being so arranged that air entering through the port means has a component of velocity directed radially into said combustor inner pipe means, said first, second, and third groups of port means are arranged so that air entering through them additionally has a component of velocity directed circumferentially around said combustor inner-pipe means to impart a swirl to fluid within said combustor inner-pipe means and said fourth group of port means are arranged so that air entering through them has no substantial component of velocity directed circumferentially around said combustor inner-pipe means.

4,429,539

HEAT EXCHANGERS FOR VUILLEUMIER CYCLE HEAT PUMPS

James W. Leach, Raleigh, N.C., assignor to Vought Corporation, Dallas, Tex.

Filed Oct. 7, 1982, Ser. No. 433,316
Int. Cl.³ F25B *9/00*
U.S. Cl. 62—6 **32 Claims**



1. A heat pump comprising:

(a) a pair of chambers and a plurality of elements extending within said chamber elements;

(b) a working fluid disposed in said chambers;

(c) a displacer means positioned in each of said chambers that is movable within said chambers, each of said displacer means having: a wall that divides said respective chambers into a first zone and a second zone, a regenerator material housed therein, a plurality of elements extending outwardly from and in proximity to said elements extending within said respective chamber, and at least one passageway communicating through said displacer means and through said respective regenerator material for said working fluid to flow therethrough between said zones;

(d) drive means suitably supported for reciprocably moving both of said displacer means in their said respective chambers between said respective zones of said chambers;

(e) means for maintaining said first respective zone of each of said chambers at a cool temperature; and

(f) means for maintaining said second respective zone of one of said chambers at a temperature that is higher than the temperature of said first respective zone and the second respective zone of said other chamber at a temperature that is lower than the temperature of said first respective zone.

4,429,540

MULTIPLE-STAGE PUMP COMPRESSOR

Francis L. Burnham, Orangeburg, S.C., assignor to Orangeburg Technologies, Inc., Orangeburg, S.C.

Continuation-in-part of Ser. No. 242,242, Mar. 10, 1981, Pat. No. 4,347,045. This application Aug. 30, 1982, Ser. No. 412,925
Int. Cl.³ F25D *17/02*; F04B *25/00*
U.S. Cl. 62—188 **25 Claims**

1. A cooling system for cooling an enclosure comprising:

a. a compressor utilizing a pump system comprising a multiple-stage pump utilizing a plurality of pumping stages for pumping a first fluid through said multiple-stage pump raising the temperature and pressure of said first fluid, said multiple-stage pump further comprising a plurality of check valves, one of said plurality of check valves being located on the input and output of said multiple-stage pump and between each of said plurality of pumping

stages, wherein each of said plurality of pumping stages comprises:

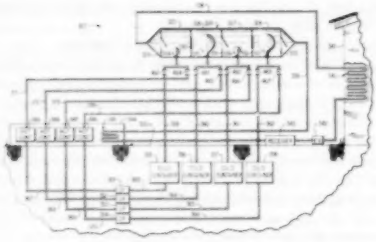
(1) a pressure chamber operable to hold said first fluid;

(2) a flexible member within said pressure chamber operable, when expanded by a vapor from a second fluid, to exert pressure against said first fluid and to force said first fluid from said pressure chamber through the one of said plurality of check valves between said pressure chamber and the next pressure chamber of the next subsequent pumping stage of said plurality of pumping stages or said output, if said pressure chamber is within the last of said plurality of pumping stages, when said pressure within said pressure chamber exceeds the next pressure in said next pressure chamber or said output; and

(3) wherein said second fluid is one of a plurality of vaporizable fluids, a different vaporizable fluid being utilized within said flexible member of each said pressure chamber,

and wherein each of said flexible members is connected to a vapor pressure control means which is operative to cause said flexible member to expand or contract at a given time, said vapor pressure control means comprising:

(i) a cold container connected to said flexible member and operative, by use of a cooling means, to keep said second fluid cold;



(ii) a hot container connected to said flexible member and operative, by use of a heating means, to keep said second fluid hot;

(iii) a cold container control means connected to said cold container operative to open or close the connection between said cold container and said flexible member; and

(iv) a hot container control means connected to said hot container operative to open or close the connection between said hot container and said flexible member;

and wherein said cooling system further comprises a condensate pump connected between said cold container and said hot container and operative to pump said second fluid from said cold container to said hot container, and a condensate pump control means connected between said cold container and said condensate pump and operative to sense the level of said second fluid in said cold container and to activate said condensate pump;

b. condensing means connected to said pump system through which said first fluid flows, which condenses said first fluid and removes heat from said first fluid; and

c. evaporating means within said enclosure connected to said pump system and said condensing means and operative to cool said enclosure.

4,429,541

APPARATUS FOR CONTROLLING OPERATION OF REFRIGERATOR

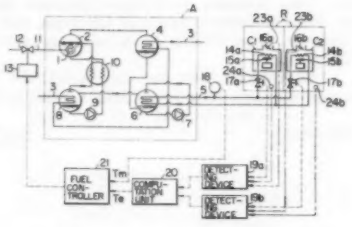
Kohji Kamejima; Yozo Hibino; Junichi Ooizumi, all of Ibaraki; Hideki Tanaka, Kudamatsu, and Morio Tamura, Ibaraki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 29, 1982, Ser. No. 343,859

Claims priority, application Japan, Feb. 2, 1981, 56-12900

Int. Cl.³ F25D *17/02;* **F25B** *15/00;* **F24F** *3/00*

U.S. Cl. 62—201 **8 Claims**



1. In a refrigerator having a capacity control mechanism adapted to control the capacity of said refrigerator in such a manner that the temperature of cold water supplied to a plurality of individual controllable air conditioners coincides with a predetermined set temperature value,

an apparatus for controlling the operation of said refrigerator comprising:

a plurality of overload detecting devices, each of which is adapted to detect the loading condition of a respective one of said air conditioners, which in turn constitutes the load on said refrigerator, and to produce an overload signal that is indicative of whether or not the respective one of said air conditioners is overloaded;

a cold water temperature computation unit adapted to calculate the set temperature value of the cold water in accordance with the overload signals coming from said overload detecting devices and to produce a signal corresponding to the calculated set temperature value;

a cold water temperature detector adapted to detect the temperature of said cold water; and

a control means adapted to determine the difference between the measured cold water temperature derived from said cold water temperature detector and said set temperature value of the cold water temperature derived from said cold water temperature computation unit and to control the capacity control mechanism of said refrigerator in accordance with said difference.

4,429,542

METHOD OF FREEZING FERTILIZED OVA, SPERMATOZOA OR THE LIKE AND APPARATUS THEREFOR

Nobuo Sakao, and Yasuo Kuraoka, both of Sapporo, Japan, assignors to Hoxan Corporation, Sapporo, Japan

Filed Aug. 2, 1982, Ser. No. 404,400

Claims priority, application Japan, Aug. 10, 1981, 56-124996; Aug. 10, 1981, 56-124997; Sep. 16, 1981, 56-137410[U]; Nov. 18, 1981, 56-184815; Jan. 14, 1982, 57-3761[U]; Mar. 12, 1982, 57-34839[U]

Int. Cl.³ F25D *25/00*

U.S. Cl. 62—62 **4 Claims**

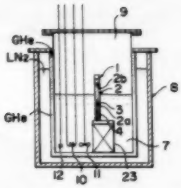
4. A method of freezing fertilized ova, spermatozoa and the like comprising the steps of:

containing articles to be frozen in a lower segment of a buffer solution in a tube,

cooling an upper segment of said buffer solution so that the upper segment of said buffer solution becomes lower in temperature than said lower segment of said buffer solu-

tion containing the articles to be frozen with a refrigerant, thereby freezing the upper segment of said buffer solution to produce crystalline nuclei,

cooling the crystalline nuclei so that the nuclei are grown to the lower segment of said buffer solution to freeze the lower segment of said buffer solution, thereby freezing the articles to be frozen,



measuring the maximum liquid temperature of the upper segment of said buffer solution when the crystalline nuclei are produced in the upper segment of said buffer solution, and

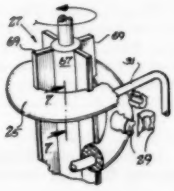
automatically controlling the cooling temperature of the lower segment of said buffer solution to the vicinity of the measured temperature.

4,429,543

ICE MAKER

Harry C. Fischer, 1819 Adrean Pl., P.O. Box 5377, Sun City Center, Fla. 33570

Filed Aug. 13, 1982, Ser. No. 407,788
Int. Cl.³ F25C 1/12
U.S. Cl. 62—73 **10 Claims**



1. Ice-making apparatus which comprises evaporator means including a helical tubing section,

elongated drive means located adjacent said helical tubing section,

means for supplying water to the exterior surface of said helical tubing section,

means for supplying refrigerant to said evaporator means so that evaporation takes place within said helical section causing the freezing of a helix of ice on the exterior surface of said helical tubing section,

means for heating said tubing section above the freezing point of water to free said ice helix from its bond to said evaporator helical tubing section following discontinuation of supply of refrigerant thereto, and

means for causing said drive means to rotate said ice helix and fracture the leading end of said helix into smaller ice pieces at a discharge point.

4,429,544

REFRIGERANT STORAGE SYSTEM FOR A HEAT PUMP

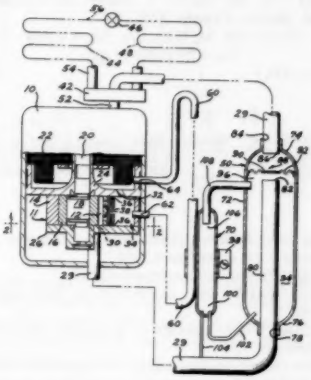
William J. McCarty, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Sep. 30, 1982, Ser. No. 430,904
Int. Cl.³ F25B 43/02
U.S. Cl. 62—84 **8 Claims**

1. The method of managing the refrigerant charge in a refrigeration system by storing liquid refrigerant and introducing it in gaseous form back into the system a compressor comprising:

accumulating a mixture of liquid refrigerant and oil in an accumulator positioned in the suction line of the system;

separating gaseous refrigerant from liquid refrigerant in said accumulator and introducing the gaseous refrigerant into the system compressor;



introducing the remaining mixture of liquid refrigerant and oil in said accumulator to a reservoir;

heating said reservoir to boil out refrigerant in gaseous form; and introducing the gaseous refrigerant to the accumulator for introduction into the system compressor; and

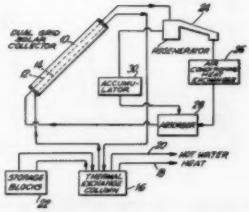
introducing the oil in the reservoir to the compressor.

4,429,545

SOLAR HEATING SYSTEM

Alfred Steinberg, Riverdale, N.J., assignor to Ocean & Atmospheric Science, Inc., Dobbs Ferry, N.Y.

Filed Aug. 3, 1981, Ser. No. 289,208
Int. Cl.³ F25B 27/00, 27/02
U.S. Cl. 62—235.1 **40 Claims**



1. A solar heating system, comprising:

solar collector means comprising heat absorber means for absorption of solar radiation and two separate riser grid systems containing respective flow mediums therein, for being heated by the solar radiation absorbed;

heat exchange means coupled to a first of said riser grid systems for extracting the heat from the flow medium therein to provide a heating fluid;

regeneration means coupled to the first of said riser grid systems for distillation of the flow medium therein to extract a component therefrom for further utilization; and

at least one of said two separate riser grid systems comprising a plurality of parallel tubes interconnected at their respective lower and upper ends by respective manifolds, said solar collector means including a heat absorber com-

prising a sheet of heat-absorption material formed into strips and woven, basket-fashion across the tubes of said at least one riser grid system.

4,429,546

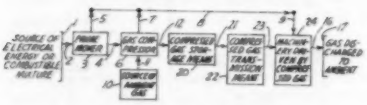
HEAT TRANSFER IN GAS COMPRESSION

Charles B. Fisher, 2850 Hill Park Rd., Montreal, Quebec, Canada H3H 1T1, and Sidney T. Fisher, 53 Morrison Ave., Montreal, Quebec, Canada H3R 1K3

Filed Mar. 14, 1983, Ser. No. 474,969

Int. Cl.³ F25B *27/02*

U.S. Cl. 62—238.1 **5 Claims**



1. A gas compression system which comprises a prime mover driving a gas compressor, and

storage means for said compressed gas, and

transmission means for said compressed gas from said storage means, and

an output load, which consists of apparatus driven by said compressed gas, and

heat transfer means, which transfers substantial amounts of heat rejected from said prime mover and said compressor to said gas at said output load.

4,429,547

ARRANGEMENT IN A HEAT PUMP PLANT

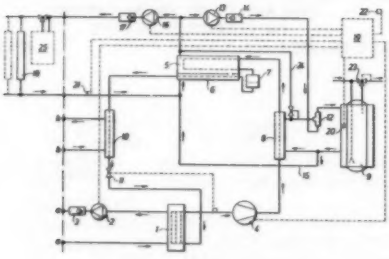
Eric Granryd, Täby, Sweden, assignor to AB Thermia-Verken, Arvika, Sweden

Filed Mar. 10, 1982, Ser. No. 356,620

Claims priority, application Sweden, Mar. 20, 1981, 8101768-3

Int. Cl.³ F25B *27/02*

U.S. Cl. 62—238.6 **6 Claims**



1. A heat pump of the type including an evaporator, a compressor, a condenser, said condenser having a built-in subcooler and an expansion valve forming a refrigerant circuit, further comprising:

a water heating pump having one end connected to said condenser heating medium outlet side;

an ejector having first, second and third ports, said first port connected to a remaining end of said water heating pump through a non-return valve;

a hot gas heat exchanger connected between the compressor and condenser inlet, said heat exchanger having a heating medium side with an outlet connected to said ejector second port, and an inlet;

a second subcooler connected between an outlet of said built-in subcooler and said expansion valve, said second subcooler having a heating medium side connected to a separate heating circuit; and

a domestic water heater having an inlet connected to said ejector third port, and an outlet connected to said hot gas heat exchanger inlet and said built-in subcooler inlet.

4,429,548

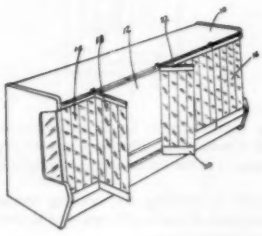
COVER FOR REFRIGERATED DISPLAY CASES

Richard C. Layne, 1312 King Ave., Apt. 4, Columbus, Ohio 43212

Filed Dec. 7, 1981, Ser. No. 328,415

Int. Cl.³ A47F *3/04*

U.S. Cl. 62—255 **6 Claims**



1. An improved refrigerated, upright type display case cover for providing an easily deformable barrier over the display case access opening, said cover being of the type having a plurality of flexible, transparent strips mounted to said display case in substantially side by side relationship and extending across said access opening, wherein the improvement comprises: said strips attached together in groups to form panels which are movably mounted at one end along a relatively higher edge of said opening, extend parallel to each other across a relatively lower edge and are held across said opening by gravitational force and wherein the relatively higher end of each panel of strips are mounted to an arm which is hingedly mounted to said relatively higher edge.

4,429,549

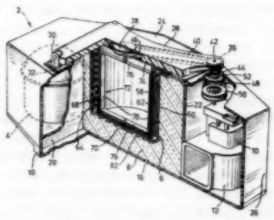
ICE-CREAM FREEZER

Peter P. M. Randolphi, P.O. Box 399, Gormley, Ontario, Canada L0G 1L0

Continuation-in-part of Ser. No. 123,033, Feb. 20, 1980, abandoned. This application Mar. 25, 1981, Ser. No. 247,591

Int. Cl.³ A23G *9/00*

U.S. Cl. 62—342 **11 Claims**



10. In apparatus for preparing ice-cream and other frozen confections comprising an integral refrigeration unit including a vertical cylindrical evaporator, a cylindrical freezing container removably lockable against rotation within the evaporator, paddle means removably located for rotation relative to the freezing container about a vertical axis, and a motor rotating the paddle means, the improvement wherein no mechanical locking of the container within the evaporator is provided but the container is locked to the evaporator by frozen moisture therebetween during a freezing cycle, the clearances between

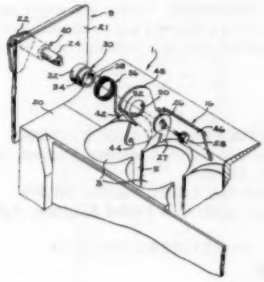
the container and the evaporator being small enough for the former to be locked by frozen moisture, when the apparatus is operated, and wherein selectively operable defrosting means are associated with the evaporator whereby such frozen moisture may be melted to release the container.

4,429,550

SWEEP MECHANISM

Bruce B. Latter, Anchorage, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Jun. 16, 1982, Ser. No. 388,807
Int. Cl.³ F25C *5/02*
U.S. Cl. 62—353 **5 Claims**



1. An icemaker comprising a freezer mold having an ice piece forming cavity, ice ejecting means including means to release the ice piece from the cavity and a pad mechanism for raising the ice piece from said cavity to a position above the top of said cavity, a sweep pivotally supported above said mold for movement from a first position rearward to said cavity to a second position overlying said cavity for engaging and sweeping the raised ice piece from said mold;

motor driven positive mechanical drive means for rotating a drive element in one direction and then in the opposite direction;

a torsion spring arranged to store energy during movement of the sweep from its first position to its second position;

means mechanically coupling the drive element in one direction of rotation to the sweep to positively drive the sweep and move the sweep from the first position to the second position;

and

means coupling the torsion spring to the sweep to return the sweep to its first position upon relase of the stored energy when the drive element is rotated by the motor driven positive mechanical drive means in its opposite direction.

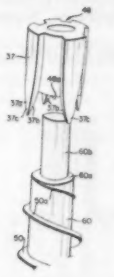
4,429,551

AUGER TYPE ICEMAKER

Akio Hizume, Nagoya, Japan, assignor to Hoshizaki Electric Co., Ltd., Toyoake, Japan

Filed Apr. 29, 1982, Ser. No. 373,139
Int. Cl.³ F25C *1/14, 5/14*
U.S. Cl. 62—354 **4 Claims**

1. An auger type icemaker comprising a refrigeration cylinder having an evaporator disposed therearound and a water inlet connected thereto in fluid communication with the interior of said cylinder to form slush ice on the inner surface of said cylinder, an auger including a rotary shaft rotatably disposed in said cylinder and a coiled scraper blade fixedly mounted around said shaft to scrape off and guide the slush ice upwardly, and an extrusion head having a lower end surface, fixedly mounted at the upper end of said cylinder with a plurality of axially downwardly and radially outwardly extending bosses disposed around the periphery of said extrusion head to form ice compressing passages between the adjacent bosses, said passages receiving the scraped slush ice from said auger and discharging the scraped slush ice therefrom after being compressed therein while passing therethrough, each of said bosses having means, including an extension of a predetermined axial length positioned below said lower end surface of said extrusion head and over a portion of said auger, for preventing the scraped slush ice from rotating together with said auger, the portion of said auger over which said extensions are positioned being sufficiently smaller in diameter than the other portions of said auger, so that interference by said extensions with said portion of said auger is avoided.

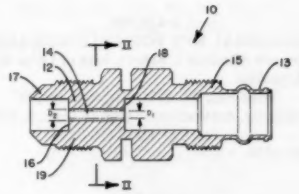


4,429,552

REFRIGERANT EXPANSION DEVICE

Wayne R. Reedy, Cazenovia, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

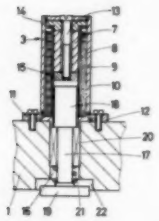
Filed Aug. 9, 1982, Ser. No. 406,141
Int. Cl.³ F25B *41/06*
U.S. Cl. 62—528 **5 Claims**



1. A refrigerant expansion device for use in a vapor compression refrigeration system, said refrigerant expansion device comprising:

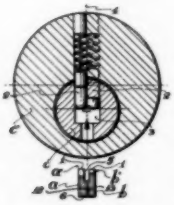
a body portion having an opening therethrough to provide a refrigerant flow restriction when said body portion is connected in the refrigerant flow path of the refrigeration system, said body portion made of a conditioned shape memory alloy to provide a first selected refrigerant flow restriction when the temperature of the refrigerant flowing through the device is equal to or less than a predetermined transformation temperature, and to provide a second selected refrigerant flow restriction when the temperature of the refrigerant flowing through the device is greater than the predetermined transformation temperature.

4,429,553
CAM-SUPPORT CARRIAGE FOR A KNITTING MACHINE
Louis Frund, Monthey, and Rémy Bruggmann, Fontanivent, both of Switzerland, assignors to Atelier de Construction Steiger S.A., Vionnaz, Switzerland
Filed May 22, 1981, Ser. No. 266,212
Claims priority, application Switzerland, Jun. 13, 1980, 4558/80
Int. Cl.³ D04B 7/00
U.S. Cl. 66—78 5 Claims



1. A cam-support carriage for a knitting machine comprising, a plurality of control devices for each controlling an individual respective knitting cam, and each having a knitting cam, each controlling device comprising means for controlling actuation of said knitting cam to a projected working position and for controlling actuation of said knitting cam to a retracted, non-working position, said means comprising permanently magnetized magnetizable means having a coercive field and energizable means receptive of control current pulses of opposite polarities to change the magnetization and coercive force of the coercive field of said magnetizable means for selectively alternately rendering the magnetizable means effective to control actuation of the knitting cam to said working position from said retracted non-working position and for rendering the magnetizable means selectively effective to control actuation of said knitting cam back to said retracted, non-working position as a function of the change of coercive force of the magnetic coercive field continuously generated by said magnetizable means.

4,429,554
BILATERAL KEY FOR CYLINDER LOCK
Noel Litvin, and Abraham I. Scherz, both of Leiva 4675, Buenos Aires, Argentina
Filed Sep. 29, 1981, Ser. No. 306,897
Claims priority, application Argentina, Apr. 8, 1981, 282463
Int. Cl.³ E05B 27/06
U.S. Cl. 70—358 4 Claims



1. A bilateral key for a cylinder lock which has more than one row of tumbler pins, thereby requiring a key having a number of generally parallel tumbler operating edges corresponding to the number of rows of tumblers with a plurality of depressions formed therein for displacing the tumbler pins to the lock combination position, said key comprising:

(a) at least first and second blade components, each of said blades having an exterior end and an operative end, each of said blades also defining along one edge thereof, an operating edge for selectively displacing tumbler pins in a cylinder lock;

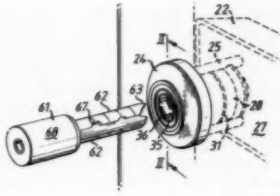
(b) a means for detachably securing said blades together;

(i) said means providing for displacement of the blades for selectively and differentially cutting a plurality of projections and recesses in each of the operating edges;

(ii) said means also securing said blades together in a side by side relationship with the respective operating edges adjacent one another;

whereby said operating edges may be separated for selectively and differentially cutting the edges and secured together to form a bilateral key to cooperatively displace rows of tumbler pins in a cylinder lock when inserted therein.

4,429,555
REVOLVING CYLINDER LOCKS
Michael A. Salsbury, South Godstone, England, assignor to Multikey Ltd., England
Filed Apr. 1, 1981, Ser. No. 249,809
Claims priority, application United Kingdom, Apr. 2, 1980, 8011094
Int. Cl.³ E05B 29/00, 19/14
U.S. Cl. 70—366 16 Claims

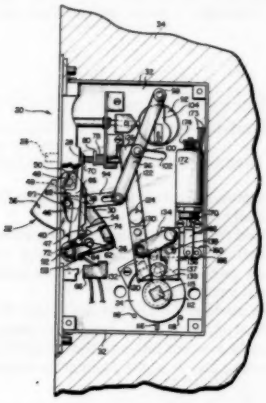


1. A revolving cylinder lock comprising a cylindrical barrel mounted coaxially in a cylindrical passage for rotation about the axis thereof characterised by a cylindrical cavity extending partly into the wall of the passage and partly into the barrel with its axis parallel the axis of the barrel and spaced from the axis of the barrel by a distance not less than the radius of the barrel and not greater than the radius of the passage wall, a cylindrical pin coaxially mounted in the cavity for rotation therein and divided into two parts along a cylindrical surface containing the pin axis and having a radius of curvature not less than that of the barrel and not greater than that of the passage, returning means operatively associated with the pin to urge the pin towards an angularly displaced position about its axis in which the axis of the cylindrical dividing surface is displaced from coincidence with the barrel axis and unlocking means operable angularly to displace the pin about its axis to bring the axis of the cylindrical dividing surface into coincidence with the axis of the barrel against the effect of the returning means.

4,429,556
LOCK MECHANISM
Raymond V. Kambic, Joliet, Ill., assignor to Brink Locking Systems, Inc., Plainfield, Ill.
Filed Aug. 13, 1981, Ser. No. 292,397
Int. Cl.³ E05B 55/06
U.S. Cl. 70—149 33 Claims

1. A knob control arrangement for a lock assembly of the type including a housing and a lock mechanism, associated with said housing and including latch means, a cam member, and link means interconnecting the cam member and the latch

means, said knob control arrangement including: a knob hub mounted with respect to the lock assembly housing for relative movement, and adapted to have a knob member operably engaged therewith, said knob hub being mounted juxtaposed said cam member interiorly of said housing, such that the knob hub can move relative to said cam member; means for selectively connecting and disconnecting said knob hub with respect to said cam member, such that when connected said knob hub and said cam member will be joined for joint movement,



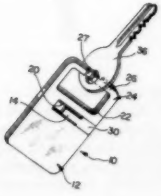
and a knob member engaged with the knob hub and said knob hub will be in an active condition whereby said operation thereof will produce movement of said cam member and correspondingly, the operation of said lock mechanism; however, when said knob hub and said cam member are not coupled for joint movement, a knob engaged with said knob hub and said knob hub will be in a passive condition, and can move relative to said cam member and said housing without producing operation of said locking mechanism.

4,429,557

KEY HOLDER

Joseph A. Morrone, III, Westerly, R.I., assignor to Adecon, Inc., Warwick, R.I.

Filed Dec. 23, 1981, Ser. No. 333,667
Int. Cl.³ A47G *29/10*
U.S. Cl. 70—456 R **12 Claims**



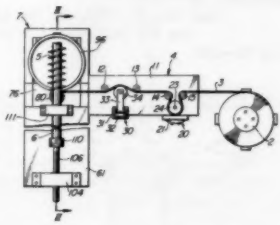
1. A holder for keys and the like comprising a pair of substantially flat plates, and means slidably interconnecting said plates to each other in abutting, face-to-face relation; said plates each having generally aligned ring-like portions, a passage extending through each of said ring-like portions, said plates being relatively slidable between a first position wherein said passages are out of registry and hence access to the interior of said ring-like portions is prevented and a second position wherein said passages are in registry and access to said ring-like portions is permitted, said interconnecting means comprising resilient integrally struck tongue members on each plate, said tongue members resiliently overlapping each other to maintain said plates slidably assembled to each other.

4,429,558

METHOD OF AND APPARATUS FOR FABRICATION OF SPIRAL FIN

Hiroya Murakami; Mitsuhiro Takasaki; Osamu Yamada, all of Yokohama; Atsuya Kamada, Kamakura, and Katsuyoshi Hori, Kure, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 15, 1981, Ser. No. 254,285
Claims priority, application Japan, Apr. 15, 1980, 55-48720
Int. Cl.³ B21D *11/08, 43/00*; B21C *37/22*; B23P *15/26*
U.S. Cl. 72—17 **7 Claims**



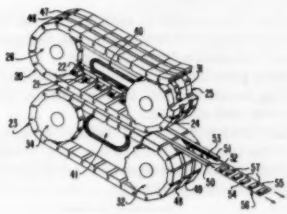
1. A method of fabricating a spiral fin in which a strip of material having a rectangular cross section is rolled and bent by a pair of rolls while being wound on a tube to form a spiral fin, wherein the method comprises imparting a tension to the strip being drawn between the pair of rolls, and controling the amount of tension imparted to the strip so that a speed at which the strip is drawn between the rolls is substantially equal to a speed at which an outer edge portion of the spiral fin is rolled so as to reduce a compressive force applied to a portion of the strip corresponding to the outer edge of the spiral fin.

4,429,559

STRIP PROCESSING APPARATUS

Gaston D. dePuglia, 13 Seascape Ct., Brookings, Oreg. 97415, and Greg A. Huber, 1701 Fortune Dr., Unit L, San Jose, Calif. 95131

Filed Jan. 26, 1982, Ser. No. 342,629
Int. Cl.³ B21D *43/00*
U.S. Cl. 72—186 **22 Claims**



1. An apparatus for processing a strip of material comprising:

a plurality of tool means interconnected in an endless chain, for shaping predetermined parts of said strip of material;

a plurality of follower means interconnected in an endless chain, for forcing said tool means against said predetermined parts of said strip of material;

a plurality of die means interconnected in an endless chain which cooperate with said tool means, for shaping said predetermined parts of said strip of material;

a plurality of stripping means interconnected in an endless chain for stripping said strip of material from said tool means after said shaping of said strip of material by said tool and die means;

means for transporting said strip of material between said stripping means and said die means; and

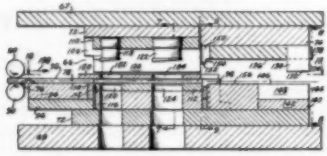
means for moving said tool, said follower, said stripping and said die means in a recirculating fashion relative to said strip of material as said strip of material is being transported therebetween.

4,429,560

APPARATUS FOR MAKING A TRANSITION PLATE FOR A MINE ROOF TRUSS

Charles W. Schaeffer, Lebanon, Pa., assignor to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Nov. 19, 1981, Ser. No. 323,322
Int. Cl.³ B21D *28/14, 28/26*
U.S. Cl. 72—328 **1 Claim**



1. Apparatus for making a transition plate for a mine roof truss from a strip of metal comprising

(1) a die set having first and second stations and means to initially feed and position said strip in said first station and thereafter feed and position said strip in said second station,

(2) said first station including

(a) means to bend the sides of said strip downwardly at substantially a right angle to the plane of said strip,

(b) means to shear a notch in both sides of the trailing portion of said strip, and

(c) means to pierce a first hole adjacent the leading portion of said strip and a second hole adjacent the trailing portion of said strip,

(3) said second station including

(a) means to bend the leading portion of said strip into a substantially "M" shape,

(b) means to shear said strip transversely at the trailing portion of said strip adjacent said notches, and

(c) means to bend the trailing portion of said strip adjacent said notches downwardly at substantially a right angle to the plane of said strip,

(4) stripper plate means in said first station for stripping said bending means, said shearing means, and said piercing means of said first station from said strip,

(5) stripper plate means in said second station for stripping said bending means and said shearing means of said second station from said strip, and

(6) means directly below said trailing end strip shearing means to lift the trailing portion of said strip in said second station upwardly in an inclined position prior to removing said strip from said second station.

4,429,561

MANDREL FOR COLD FORGING INTERNALLY PROFILED TUBES OR CYLINDERS

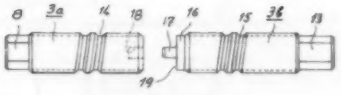
Ivan O. Ramnesten, Eskilstuna, Sweden, assignor to Forenade Fabriksverken, Eskilstuna, Sweden

Filed Jan. 22, 1982, Ser. No. 341,666
Claims priority, application Sweden, Feb. 3, 1981, 8100772
Int. Cl.³ B21J *13/02*
U.S. Cl. 72—478 **4 Claims**

1. A mandrel receivable in a tubular cold forging blank for cooperation with forging hammers which repeatedly radially inwardly impact against the exterior of the blank, all around it and along its length, to form the blank into a substantially tubular product that has an internal radially inwardly projecting circumferential rib intermediate its ends and has an internal thread that extends axially from one of its ends to said rib, said mandrel being characterized by:

A. said mandrel having a concentric reduced diameter portion intermediate its ends that defines a circumferential groove in the mandrel whereby said rib is formed;

B. said mandrel comprising two axially separable parts which abuttingly engage one another at said reduced



diameter portion thereof to be removable from the product in axially opposite directions;

C. One of said parts of the mandrel having an external thread which defines said internal thread and which extends along that mandrel part from said reduced diameter portion of the mandrel; and

D. said one mandrel part, along the length of said external thread thereon, being of taperingly decreasing diameter in the direction towards said reduced diameter portion, to be readily removable from the product by rotation relative to it.

4,429,562

AUTO BODY DENT REMOVING PULLER AND ANCHOR

John V. Hultquist, 10500 Westminster St., Apt. #13, Garden Grove, Calif. 92643

Filed Apr. 7, 1981, Ser. No. 251,952
Int. Cl.³ B21D *1/12*
U.S. Cl. 72—479 **7 Claims**

1. A dent pulling tool comprising:

(a) an elongated shank having a head at one end larger than the diameter of said shank, wherein the other end of said shank is adapted to be attached to handle means;

(b) a cylinder mounted on said shank, said cylinder having an opening extending therethrough from one end of said cylinder to the other end, said cylinder having slots extending from opposite ends on opposite sides thereof in a manner and at a depth such that a transverse opening is defined which extends transversely through said cylinder; wherein said shank extends through said cylinder and said slots are dimensioned to receive said shank when said cylinder is oriented parallel to said shank; and wherein said transverse opening is sufficiently large to enable said cylinder to be tilted perpendicular to said shank,

(c) a lever slidably mounted on said shank between an outward position and an inward position,

(d) a first rod connected at one end to said lever and at its other end to said cylinder,

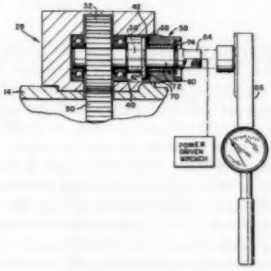
(e) a second rod secured to said shank, wherein said cylinder is pivoted from a first position parallel to said shank to a second position perpendicular to said shank by means of said first rod when said lever is moved from its outward position to its inward position, and wherein said cylinder is pivoted from its said perpendicular position to its said parallel position by means of one end of said cylinder being urged against said second rod when said lever is moved to its outward position.

4,429,563

MECHANICAL SNUBBER APPARATUS

Harry E. Sulzer, Telford, Pa., assignor to Anchor/Darling Industries, Inc., Radnor, Pa.

Filed Oct. 30, 1981, Ser. No. 316,846
Int. Cl.³ G01M *19/00*
U.S. Cl. 73—11 **5 Claims**



1. An apparatus for testing the operation of a mechanical snubber having first and second sections engaged one with the other, the first section including linear motion input means and the second section including a drive gear coupled to motion limiting means, the apparatus comprising:

a tester housing adapted to be coupled to the snubber; and

actuator gear means rotatably supported by the tester housing, said actuator gear means being engageable with the drive gear and being adapted for engagement by test means for driving the actuator gear means to rotate the drive gear for testing the operation of the motion limiting means.

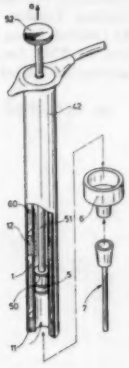
4,429,564

VIBRATION TYPE DENSITY METER

Kyoichi Ikeda; Motoyoshi Ando, and Kinji Harada, all of Tokyo, Japan, assignors to Yokogawa Hokushin Electric Corporation, Tokyo, Japan

Filed Dec. 14, 1981, Ser. No. 330,175
Claims priority, application Japan, Jan. 23, 1981, 56-8892[U]; Jan. 23, 1981, 56-8893[U]
Int. Cl.³ G01N *9/00*
U.S. Cl. 73—32 A **9 Claims**

1. A probe for use with a vibration type density meter for measuring density of a specimen fluid, said probe comprising a cylindrical resonator means having two flanges at each end thereof, at last one of said ends being open for introducing said specimen fluid into said resonator means; a cover means rigidly fixed to said two flanges and in surrounding relation to said resonator means, said cover means and said resonator means jointly defining therebetween a chamber, said chamber being filled with a gas kept at a predetermined pressure; means for



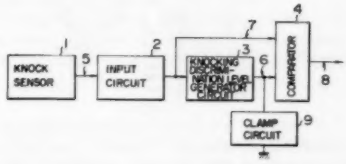
exciting said resonator means; and means for detecting a circumferential mode of oscillations of said resonator means.

4,429,565

KNOCKING DETECTING APPARATUS FOR AN INTERNAL COMBUSTION ENGINE

Hiroo Utsumi; Yukio Sakakibara; Teruyoshi Ito, all of Kariya; Toshiharu Iwata, Aichi; Jun Ohta, Nagoya; Kiyokane Kazi, Toyota; Osamu Hori, Toyota, and Mitsuyuki Banno, Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota and Nippondenso Co., Ltd., Kariya, both of, Japan

Filed Apr. 7, 1981, Ser. No. 252,001
Claims priority, application Japan, Apr. 9, 1980, 55-48002[U]
Int. Cl.³ G01L *23/22*
U.S. Cl. 73—35 **6 Claims**



1. A knocking detecting apparatus for an internal combustion engine comprising:

knocking detector means for detecting a factor of knocking in the internal combustion engine and generating an output signal,

generating means for generating a discrimination signal in response to the output signal of said knocking detector means,

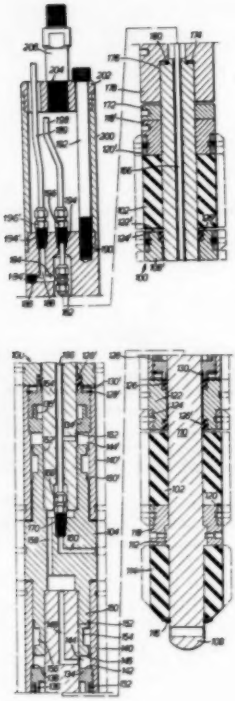
limiting means for limiting the discrimination signal from said detector means below a predetermined value at a high speed of said engine so as to enable the detection of a trace knock, and

comparator means for comparing the output signal from said knocking detector means and the said discrimination signal limited by said limiting means to generate a pulse signal indicative of a knocking.

4,429,566
PIPING LEAKAGE DETECTION METHOD AND APPARATUS

Richard A. Armell, Montrose, Scotland, and John G. Misselbrook, Hawridge Common, Nr.Chesham, England, assignors to Boc-Nowsco Limited, London, England and Drexel Oil Field Service (HK) Limited, Hong Kong, Hong Kong

Filed Aug. 12, 1980, Ser. No. 177,468
Claims priority, application United Kingdom, Aug. 13, 1979, 7928076
Int. Cl.³ G01M 3/22
U.S. Cl. 73—40.7 16 Claims



1. A method of testing for leaks in tubing and tube joints comprising the steps of:

(a) locating within the tubing to be tested a tool having spaced resilient seals so that the seals are positioned one on each side of the joint or section of tubing to be tested;

(b) actuating the tool by a pressure fluid so that the seals are deformed so as to maintain a constant pressure against the internal surface of the tubing;

(c) passing gaseous search fluid at a different pressure less than that of the seal-actuating pressure fluid through the tool and into an annular space between the tool and the internal surface of the joint or section of tubing to be tested;

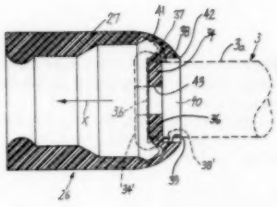
(d) substantially containing any said gaseous search fluid which may have leaked from the joint or section of tubing; and

(e) detecting quantitatively the presence of any contained said search fluid on the outside of the joint or section of tubing under test whereby the detecting of a leak can be effected.

4,429,567
APPARATUS FOR TESTING CIGARETTES OR THE LIKE

Franz P. Koch, Schwarzenbek; Adolf Helms, Hamburg; Wolfgang Siems, Hamburg, and Peter Brand, Hamburg, all of Fed. Rep. of Germany, assignors to Hauni-Werke Körber & Co. KG, Hamburg, Fed. Rep. of Germany

Filed Nov. 2, 1981, Ser. No. 317,419
Claims priority, application Fed. Rep. of Germany, Nov. 3, 1980, 3041217
Int. Cl.³ G01M 3/00
U.S. Cl. 73—49.8 17 Claims

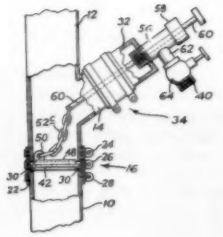


1. In an apparatus for testing cigarettes or analogous rod-shaped articles, the combination of an article transporting conveyor; at least one sealing element movable in synchronism with said conveyor and including a partition and an elastic tubular section adjacent to and defining with said partition a socket for one end of an article on said conveyor, said section having an internal surface surrounding said socket and being contractible as a result of deformation and attendant reduction of the inner diameter of said section in response to displacement of said partition in a predetermined direction; and means for effecting a relative movement between said conveyor and said sealing element so as to introduce one end of an article on said conveyor into said socket and to thereupon cause the thus introduced end of the article to move said partition in said direction whereby said internal surface sealingly engages the external surface of the article.

4,429,568
CLOSURE PLUG ASSEMBLY FOR PRESSURE TESTING LIQUID DRAIN AND VENT PLUMBING PIPE SYSTEMS

Richard N. Sullivan, 7911 SE. 82nd Ave., Portland, Oreg. 97266

Filed Apr. 30, 1982, Ser. No. 373,324
Int. Cl.³ G01M 3/04
U.S. Cl. 73—49.8 3 Claims



1. A closure plug assembly for the pressure testing of liquid drain and vent plumbing systems having a Y or T test section with a test opening, the test assembly comprising:

(a) a cap sub-assembly,

(b) sealing means for releasably securing the cap sub-assembly across the test opening in sealed relation thereto,

(c) plug means removably insertable in the plumbing system adjacent the test opening for damming the flow of liquid

upstream from the test opening, the plug means comprising a rigid perforate plate insertable in and dimensioned to span the pipe of the plumbing system downstream from the test opening in sealed relation thereto, and an imperforate plate superimposed on the perforate plate and dimensioned to seal the perforations therein, and support means supporting the plates in the pipe,

(d) link means connected to the imperforate plate for removing the same at the conclusion of the testing operation, and

(e) valved port means in the cap sub-assembly for filling the plumbing system with test liquid under pressure during the testing operation.

4,429,569

DEVICE FOR TESTING THE SHORE-HARDNESS OF RUBBER-LIKE ARTICLES

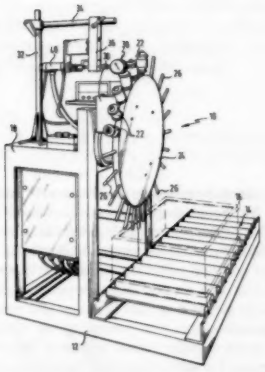
Erich Frank, Bad König; Walter Scheuermann, Erbach, and Georg Volk, Breuberg, all of Fed. Rep. of Germany, assignors to Metzeler Kautschuk GmbH, Munich, Fed. Rep. of Germany

Filed Apr. 13, 1982, Ser. No. 367,896

Claims priority, application Fed. Rep. of Germany, Apr. 18, 1981, 3115814

Int. Cl.³ G01N *3/42*

U.S. Cl. 73—81 **5 Claims**



1. Device for testing the Shore-hardness of rubber-like bodies comprising

(a) a measuring head with a movable penetrator which can be positioned onto the surface of the rubber-like body for testing the Shore-hardness,

(b) a rotatable circular plate disposed in a vertical plane,

(c) a plurality of spaced mounting elements dispoed at the circumference of the circular plate for holding said rubber-like bodies during rotaton of the circular plate to bring each said body to the measuring head for testing and away from the head after testing,

(d) an adjustable mounting arrangement which is movable to adapt to rubber-like bodies of different dimensions, for holding the measuring head in position adjacent the rubber-like body for testing Shore-hardness, and

(e) an actuating device connected to the measuring head for actuating said movable penetrator, wherein the mounting elements are pins and the rubber-like bodies are hollow, and where said pins for holding the hollow rubber-like bodies protrude radially from the circumference of the circular plate.

4,429,570

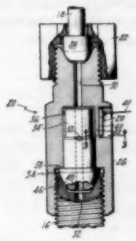
INJECTION TIMING TRANSDUCER

David V. Tinder, Dearborn, Mich., assignor to Essex Group, Inc., Fort Wayne, Ind.

Filed Sep. 25, 1981, Ser. No. 306,049

Int. Cl.³ G01M *15/00*; G01L *7/08*; F02P *17/00*

U.S. Cl. 73—119 A **12 Claims**



1. An injection timing transducer for use with the fuel delivery system of a compression ignition engine, said fuel delivery system supplying pressurized pulses of fuel from pumping means to injecting means for injection into the engine via a fuel flow path, the transducer comprising:

a housing member insertable in the fuel flow path in sealed relation therewith, said housing member including a bore extending longitudinally therethrough in flow registry with said flow path for maintaining continuity of said flow path, said bore being of a first diameter for one portion of its length and being of a relatively larger second diameter along a second portion of its length longitudinally adjacent to and downstream of said one portion, said bore including a chamber in fluid communication with said flow path, a section of said member being sufficiently thin-walled adjacent to said chamber therein for transmitting pressure pulsations in the fuel therethrough to a relatively external sensor mount position;

an insert member positioned within part of said second portion of the length of said bore in said housing member, said insert member including an outside diameter intermediate said first and said second diameters of the housing member bore to define a substantially annular portion of said bore including said chamber; and

sensing means mounted on said housing member at said sensor mount position for sensing said pressure pulsations and for providing electrical signals indicative thereof.

4,429,571

COMPOUND LIQUID FLOW METER

Donald J. Kullmann; William G. Karjalainen, and Rodney G. Harris, all of Tallassee, Ala., assignors to Neptune Water Meter Company, Tallassee, Ala.

PCT No. PCT/US80/00763, § 371 Date Jan. 25, 1982, § 102(e) Date Jan. 25, 1982, PCT Pub. No. WO81/03700, PCT Pub. Date Dec. 24, 1981

PCT Filed Jun. 13, 1980, Ser. No. 358,842

Int. Cl.³ G01F *7/00*

U.S. Cl. 73—197 **4 Claims**

1. A compound liquid flow meter including:

a. a casing open along one side and having at one end and inlet adapted for connection to a supply conduit and at its opposite end an outlet adapted for connection to a discharge conduit;

b. a cover closing the open side of the casing;

c. a main flow path through the casing including:

1. a turbine meter supported by the cover and having a characteristic of accuracy over a first range of flow rates greater than a predetermined rate and of rapid acceleration in response to increasing flow; and

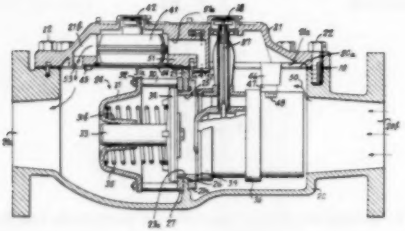
2. a main valve controlling the flow through the turbine meter;

d. an auxiliary flow path extending from the inlet to the outlet and including:

1. a low flow measuring meter supported by the cover and having a characteristic of accuracy over a second range of flow rates lower than and overlapping said first range of flow rates;

2. an auxiliary valve supported by the cover and controlling the flow through said low flow meter;

wherein the improvement comprises:



e. a transverse wall in said casing between the inlet and the outlet, said wall having an aperture therein;

f. means supporting said main valve on the downstream side of the wall so that the main valve controls the flow through the aperture;

g. spring means biasing the main valve to closed position;

h. means sealing the downstream end of the turbine meter to the upstream side of the wall at the periphery of said aperture; and

i. a transverse wall in the cover abutting the transverse wall in the casing, said cover transverse wall having an aperture therethrough forming part of said auxiliary flow path.

4,429,572

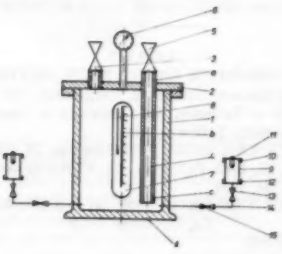
METHOD AND APPARATUS FOR THE DETERMINATION OF THE DENSITY OF LIGHT HYDROCARBONS MIXTURES

Iuliu M. Cuciuat; Gabriel Holdis, and Valentin E. Hanciulescu, all of Cimpina, Romania, assignors to Institutul de Cercetari si Proiectari Pentru Petrol si Gaze, Cimpinia, Romania

Filed Aug. 3, 1981, Ser. No. 289,145

Int. Cl.³ G01N *9/04*

U.S. Cl. 73—433 **2 Claims**



1. A method to aid in the determination of the density of a light hydrocarbon mixture which comprises the following steps:

(a) thermostatting the light hydrocarbon mixture in a large thermostatted vessel at a temperature at which said mixture is liquid in said thermostatted vessel below a level of the surface of the liquid mixture;

(b) connecting said large thermostatted vessel simultaneously to a plurality of small containers of known mass and of a known volume at said temperature;

(c) transferring a portion of said thermostatted light hydrocarbon mixture from said large vessel below said level to said small containers until said small containers are filled with the light hydrocarbon mixture in liquid form, said small containers being thermostatted to said temperature;

(d) venting any vapor present in said small containers during the filling to thereof ensure complete filling with the light hydrocarbon mixture entirely in liquid form;

(e) disconnecting the small thermostatted containers from the large thermostatted vessel and determining the mass of the small containers and the light hydrocarbon mixture; and

(f) relating the mass of the small containers and the light hydrocarbon mixture to the density of the light hydrocarbon mixture at a given reference temperature.

4,429,573

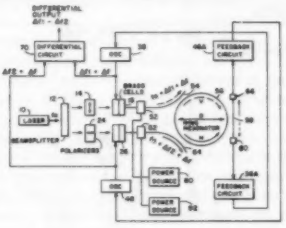
COMMON RESONATOR PASSIVE LASER ACCELEROMETER AND GYRO

Clifford G. Walker, 915 Weatherly Rd., Huntsville, Ala. 35803

Filed Jun. 29, 1982, Ser. No. 393,279

Int. Cl.³ G01C *19/58, 21/00*; G01P *15/08*

U.S. Cl. 73—510 **7 Claims**



1. A common resonator accelerometer and gyro comprising: a laser for generating a beam of coherent light, polarizing means for providing respective first and second orthogonally polarized light beams output, a beamsplitter disposed between said laser and said polarizing means for coupling light therebetween, first and second photodetectors, photoelastic optical waveguide means disposed between said polarizing means and said photodetectors for providing an optical path therebetween, stress transfer means disposed adjacent to said waveguide means for subjecting said waveguide means to acceleration stress forces, modulating means disposed between said polarizing means and said waveguide means for modulating said laser light coupled to said waveguide means, and first and second feedback circuits responsive respectively to said first and second photodetectors for providing a variable feedback to said modulating means, said variable feedback being an output signal indicative of acceleration and rotational stress forces and said waveguide means comprising at least first and second input waveguides, an output waveguide, and a ring resonator waveguide therebetween.

4,429,574

MASS MEASURING SYSTEM

Robert C. Barry, 1 Tarlton Ct., Mantua, N.J. 08051, and Gary Rachfalski, 206 Lincoln Ave., Collingswood, N.J. 08108

Filed Oct. 29, 1981, Ser. No. 316,507

Int. Cl.³ G01G *3/16*

U.S. Cl. 73—580 **8 Claims**

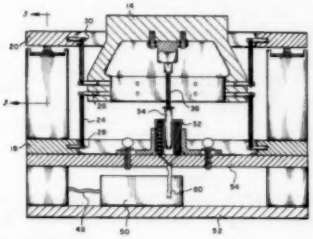
1. A mass measuring apparatus comprising:

a base member;

a support means including a substantially horizontal surface for supporting a sample mass to be measured, said support

means being substantially circular in horizontal cross section, the mass of said support means being distributed so that it increases radially outwardly from the center thereof at a rate greater than the square of the distance from the center;

spring means connecting said support means to said base member so as to allow substantially only vertical vibrating motion of said support means relative to said base member;



first transducer means for generating an electrical output signal in response to and representative of said vibratory motion of said support means;

second transducer means coupled to said support means for vibrating the same in response to said signal to thereby sustain said vibratory motion of said support means;

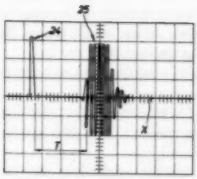
electronic circuit means including means for evaluating said signal and for generating a mass signal in response thereto representing the mass of said sample.

4,429,575

METHOD FOR INSPECTING A NON-METALLIC OBJECT BY MEANS OF IMPACT ELASTIC WAVES AND ITS APPARATUS

Tameyuki Akishika, No. 4384, Totsuka-machi, Totsuka-ku, Yokohama-shi, Kanagawa-ken, Japan

Filed Sep. 3, 1981, Ser. No. 298,959
Claims priority, application Japan, Apr. 24, 1981, 56-62063
Int. Cl.³ G01N *29/04*
U.S. Cl. 73—598 **5 Claims**



1. Method for inspecting a non-metallic object by means of impact elastic waves comprising:

propagating impact elastic waves into the non-metallic object by giving a mechanical impact to an impact plate mounted on the non-metallic object;

receiving selectively a frequency exceeding several MHz out of the impact elastic waves immediately by a thickness piezoelectric element;

detecting and memorizing electrically a generating time of the impact elastic waves by converting into pulse signals a specified higher frequency extracted from the selectively received frequency exceeding several MHz;

receiving selectively by a deflection piezoelectric element a frequency exceeding several KHz out of the elastic waves propagated into the non-metalic object and reflected from an opposite boundary thereof or from any foreign mater contained therefrom;

detecting and memorizing electrically the propagated and reflected impact elastic waves by converting into pulse signals a specified higher frequency extracted from the selectively received frequency; and

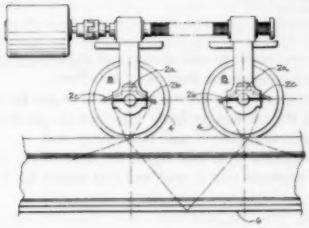
the memorized generating time of the impact elastic waves being compared with a receiving time of the reflected impact waves, thereby a thickness of the non-metallic object being measured or any foreign matter contained therein being detected.

4,429,576

ULTRASONIC INSPECTION APPARATUS

James R. Norris, New Fairfield, Conn., assignor to Dapco Industries, Inc., Ridgefield, Conn.

Filed Aug. 3, 1981, Ser. No. 289,209
Int. Cl.³ G01N *29/04*
U.S. Cl. 73—636 **19 Claims**



19. In an apparatus for inspecting a test piece and indicating an unacceptable condition therein, including means for transmitting a test signal into said test piece, for receiving an associated response signal reflected back thereto, and for generating a defect signal when the character of said response signal indicates an unexpected condition in said test piece; means for moving said transmitting-receiving means relative to said test piece; means for generating a control signal at each of a plurality of predetermined intervals of distance of said movement of said transmitting-receiving means; means for pulsing said transmitting-receiving means to sequentially generate test signals at a frequency independent of generation of said control signals; and principal counter means for counting said control signals in response to generation of defect signals and being reset to an initial value in response to the absence of defect signals, said principal counter means further producing an alarm signal when it accumulates a count of said control signals that exceeds a predetermined amount in response to generation of sufficient defect signals during said movement of said transmitting-receiving means over a predetermined distance to confirm the presence of an abnormal condition that is unacceptable; the improvement comprising:

resetting means for resetting said principal counter means only in the absence of generation of defect signals during movement of said transmitting-receiving means over a distance at least equal to the maximum distance during which a defect signal may not be generated from an unacceptable abnormal condition.

4,429,577

ULTRASONIC TRANSDUCER SYSTEM WITH FLUID APPLICATOR

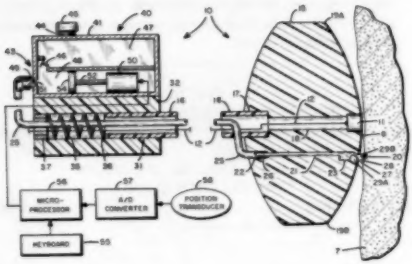
Paul D. Sorenson, Blaine, and Dale A. Dickson, Fridley, both of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

Filed Sep. 3, 1982, Ser. No. 414,702
Int. Cl.³ G01N *29/00*
U.S. Cl. 73—644 **6 Claims**

1. An ultrasonic transducer system for scanning a body, the

system including a module of the type having a transducer for converting electrical energy to a beam of ultrasonic energy and for converting received ultrasonic energy to electrical signals and a means for conducting electrical energy to said transducer, said transducer being supported in a housing, the system characterized by:

a source of acoustic coupling fluid;



means connected to said source and located on the exterior of said housing for dispensing said fluid;

means responsive to movement of said means for dispensing along the transducer/body interface for producing a signal representative of said movement; and

means responsive to said signal for controlling the flow of fluid between said source and said means for dispensing.

4,429,578

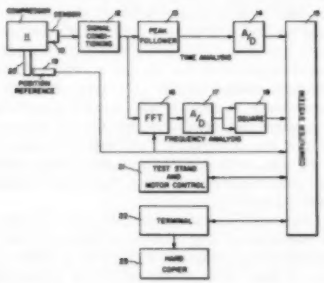
ACOUSTICAL DEFECT DETECTION SYSTEM

Bernard Darrel, and Joseph Czechowski, III, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Mar. 22, 1982, Ser. No. 360,293

Int. Cl.³ G01H *1/00*; G01M *7/00*; G01N *29/04*

U.S. Cl. 73—659 **15 Claims**



1. A nonintrusive method of detecting internal defects in moving devices which have repetitive movements comprising:

generating a sensor signal corresponding to the vibrations of said device during at least one cycle of movement;

analyzing said sensor signal in real time to produce a time signature related to device position that is the envelope of said signal, and to produce a set of frequency signatures related to device position that are the separate power spectra for fractions of a cycle; and

comparing said signatures with those of an acceptable device to identify abnormalities in vibration.

4,429,579

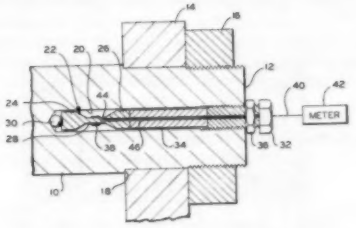
TIE ROD TENSION SENSOR

Donald F. Wilhelm, Maumee, Ohio, assignor to Helm Instrument Co., Inc., Maumee, Ohio

Filed Oct. 26, 1981, Ser. No. 314,987

Int. Cl.³ G01B *7/18*; G01L *1/22*

U.S. Cl. 73—768 **7 Claims**



1. A load sensor for measuring the tension forces applied to a rod, the rod having an elongated axially-extending bore formed in one end thereof, comprising:

a ball adapted to be inserted in the bore for contacting a closed end thereof;

a sensing member adapted to be inserted in the bore having two end portions each tapering towards a narrower central shaft portion between said end portions, one of said end portions being countersunk to receive a portion of said ball;

strain gauge means attached to said central shaft portion for measuring the amount of force applied thereto;

a spacer adapted to be inserted in the bore for contacting the other of said end portions of said sensing member; and

pre-loading means engageable with the rod and said spacer for compressing said sensing member by a predetermined amount, whereby the tension applied to the rod will be measured as a decrease in the pre-loaded compression force applied to said sensing member.

5. A method of measuring the tension forces applied to a rod including the steps of:

a. forming an elongated axially-extending bore in one end of the rod;

b. inserting a sensing member into the bore, said sensing member including strain gauge means for measuring the amount of force applied thereto;

c. inserting a spacer into the bore so as to contact said sensing member;

d. inserting a pre-loading means into the bore and compressing said sensing member and said spacer by a predetermined amount; and

e. measuring the tension applied to the rod as a change in resistivity of said strain gauge means indicating a decrease in the pre-loaded compression force applied to said sensing member.

4,429,580

STRESS TRANSDUCER FOR FABRICS AND FLEXIBLE SHEET MATERIALS

Rene B. Testa, Demarest, N.J., and Wassief M. Boctor, Rego Park, N.Y., assignors to Rene B. Testa, Demarest, N.J.

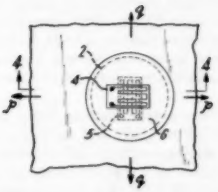
Filed Feb. 9, 1982, Ser. No. 347,366

Int. Cl.³ G01B *7/18*

U.S. Cl. 73—768 **11 Claims**

1. A transducer assembly for measuring stress in material, comprising transducer means mounted in an opening in said

material and bonded substantially continuously about said opening such that said transducer means comprises an inclusion relative to said material for directly sensing stresses which develop therein.

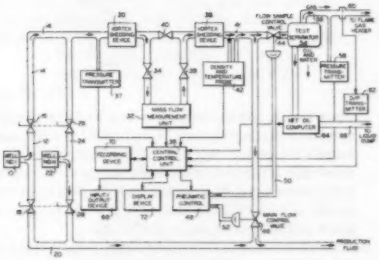


4,429,581

MULTIPHASE FLOW MEASUREMENT SYSTEM

Robert E. Furmaga, New Orleans, assignor to Baker CAC, Inc., Belle Chasse, La.

Filed May 26, 1981, Ser. No. 267,276
Int. Cl.³ G01F *13/00*; E21B *47/00*
U.S. Cl. 73—861.04 **10 Claims**



1. An apparatus for determining a total flow rate for each of a plurality of fluid components of a production fluid mixture from a subterranean well, comprising: means coupled to an outlet of the well for measuring a total mass flow rate of the production fluid mixture; means coupled to receive a sample portion of the production fluid mixture for measuring a sample flow rate for each one of the fluid components in said sample portion of the production fluid mixture; and means responsive to said mass flow rate measurement means and said sample flow rate measurement means for determining the total flow rate of each one of the fluid components.

4,429,582

VORTEX SHEDDING FLOWMETER CIRCUIT WITH ANALOG AND PULSE OUTPUT SIGNAL

William L. Thompson, Chardon, Ohio, assignor to The Babcock & Wilcox Company, New Orleans, La.

Filed Dec. 10, 1981, Ser. No. 329,531
Int. Cl.³ G01F *1/32*
U.S. Cl. 73—861.22 **4 Claims**

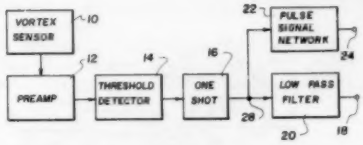
1. A vortex shedding flowmeter circuit arrangement comprising:

a vortex sensor for generating a vortex shedding frequency signal;

pulse means for generating a fixed width pulse with a frequency equal to the vortex shedding frequency signal, connected to said vortex sensor;

a low pass filter for generating an analog signal which is proportional in level to the vortex shedding frequency signal, connected to said pulse means for receiving the fixed width pulse; and

an output stage connected to said pulse means and low pass filter for selectively receiving at least one of said fixed width pulse and analog signal, a two wire transmission line connected to said output stage, and power supply means connected to said two wire transmission line including an amplifier having a negative and a positive input and an output proportional to a difference between a value at the positive and negative input, and feedback means connected between the amplifier output and its negative input for adjusting the amplifier output to equal a current sensed in said transmission line, said positive input of said amplifier connected to receive at least one of said fixed width pulse and analog signal.

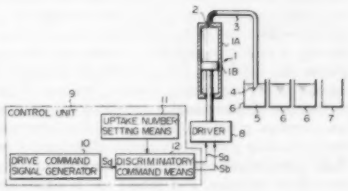


4,429,583

LIQUID UPTAKE AND DISCHARGE APPARATUS

Mitsuo Watanabe; Shigeyuki Kimura; Hideki Konishi, all of Tokyo; Yasuhiro Tsuji, and Kiyoshige Wakabayashi, both of Saitama, all of Japan, assignors to Chugai Seiyaku Kabushiki Kaisha and Japan Spectroscopic Co., Ltd., both of Tokyo, Japan

Filed Mar. 26, 1982, Ser. No. 362,161
Claims priority, application Japan, Mar. 31, 1981, 56-47368
Int. Cl.³ G01F *11/06*
U.S. Cl. 73—864.12 **19 Claims**



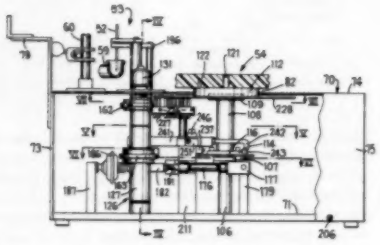
1. An apparatus for taking up and discharging liquid, which comprises at least one piston cylinder which functions to take up and discharge liquid, a drive unit for actuating said piston cylinder, and a control unit for controlling said drive unit, said control unit including signal generating means for generating a drive command signal in response to which said piston cylinder executes a liquid uptake or discharge operation, setting means for setting the number of liquid uptake operations to be executed by said piston cylinder, and discriminatory command means for producing an uptake command signal in response to the drive command signal until the number of said drive command signals arriving from said signal generating means reaches the number of liquid uptake operations set by said setting means, and for producing a discharge command signal in response to the drive command signal when the number of said drive signals exceeds said set number of liquid uptake operations.

4,429,584

MICROPROCESSOR CONTROLLABLE AUTOMATIC SAMPLER

William F. Beyer; Harry S. Dankert, both of Kalamazoo, and James C. English, Schoolcraft, all of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Dec. 1, 1981, Ser. No. 326,445
Int. Cl.³ G01N *35/06*
U.S. Cl. 73—864.21 **15 Claims**



1. An apparatus for automatically establishing fluid communication between probe means and a plurality of containers presented in a controlled sequence to a sampling position, comprising:

rack means adapted to hold said containers for movement into and out of said sampling position;

hollow probe means supported by probe holding means and movably thereby into and out of said sampling position; and

drive means connected to said rack means and to said probe holding means for effecting and controlling said movements thereof, said drive means including a first pressure fluid operated motor actuable for moving said probe means into and out of said sampling position for communication with containers thereat, and a second pressure fluid operated motor actuable for causing said rack means to move a desired one of said containers to said sampling position, said first and second pressure fluid operated motors being actuable independently of each other from a common source of pressure fluid, said first motor comprising a first pressure fluid cylinder actuable to move said probe means vertically, said first pressure fluid cylinder having a casing upstanding within said housing and a piston rod vertically reciprocable by pressure fluid, said second motor comprising a second pressure fluid cylinder with a casing horizontally extending from and supported on a vertical pivot axis fixed on said housing and a piston rod extending generally tangentially of said first pressure fluid cylinder and operatively connected to said first pressure fluid cylinder, and means for horizontally moving both said probe means and rack means for shifting said probe means between said sampling position and a rinse position, and for advancing said rack means to bring another container to said sampling position.

4,429,585

TRACTION DRIVE FOR TRAVELING TORCH OR THE LIKE

Gerald B. Grant, Denton, and Robert A. Brune, Jr., Austin, both of Tex., assignors to Victor Equipment Company, Denton, Tex.

Filed Apr. 3, 1981, Ser. No. 250,632
Int. Cl.³ F16H *15/16, 15/68*
U.S. Cl. 74—191 **2 Claims**

1. A drive means for driving a wheeled carriage at a plurality of respective speeds comprising:

a housing;

a plurality of at least three wheels carrying said housing; said wheels including at least one driving wheel;

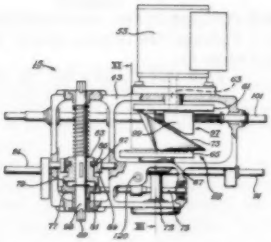
a constant speed power means having a power input shaft and carried by said housing;

a two stage, three friction element, variable speed traction drive transmission consisting essentially of:

a first power input disc in said housing and connected with said power input shaft so as to be driven therewith; said first power input disc having a substantially planar surface to facilitate movement of a traction cone therealong;

a second power output traction disc in said housing and having an output shaft; said second power output traction disc having a substantially planar surface to facilitate movement of a traction cone therealong; said second power output traction disc having its planar surface substantially parallel with said planar surface of said first power input disc;

a traction cone disposed angularly intermediate and engaging said first and second power input and output



discs along, respectively, the base and the conical portion such that movement of said traction cone along the respective planar surfaces of the respective discs will move the respective points of contact with said respective power input and output traction discs and vary the speed of said output shaft over a wide range with respect to said power input shaft; and

means for moving said traction cone with respect to said substantially parallel and planar surfaces of said first and second power input and output disc for effecting the respective speeds; said means defining a track substantially parallel to said parallel surfaces such that said traction cone can be moved easily along said parallel surfaces; and

an automatic wear-adjusting means, comprising a spring biasing said two parallel surfaces of said two discs toward each other so as to maintain frictional engagement with said traction cone.

4,429,586

DOUBLE-OBLIQUE-TOOTHED TWO-STAGE SPUR WHEEL DRIVE

Maximilian Dopfer, Sonthofen, and Günther Heidrich, Burgberg-Ortwang, both of Fed. Rep. of Germany, assignors to BHS-Bayerische Berg, Hütten-und Salzwerke Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Sep. 26, 1980, Ser. No. 191,159
Claims priority, application Fed. Rep. of Germany, Oct. 4, 1979, 2940323
Int. Cl.³ F16H *57/00, 1/12, 1/20, 37/06*
U.S. Cl. 74—410 **5 Claims**

1. A double oblique toothed two stage spur wheel drive comprising:

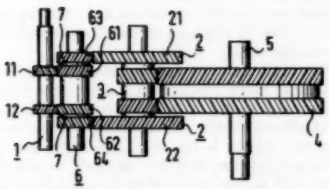
a first stage including:

a first dual pinion assembly (1) composed of a coaxial pair of pinion gears (11, 12) having oppositely directed oblique teeth,

a first coaxial intermediate gear pair (61, 62) driven by said first dual pinion (1) and a second intermediate gear pair (63, 64) coaxial with the first intermediate gear pair (61,

62) and driven thereby, said first and second intermediate gear pairs being of the same diameter and gearing geometry,

a first coaxial gearwheel pair (2) driven by said second intermediate gear pair (63, 64) and



a second stage including:

a second dual pinion assembly (3) composed of a coaxial pair of pinion gears coaxial with said first gearwheel pair (2) and driven thereby, and at least one second gearwheel (4) meshing with and driven by said second pinion (3).

4,429,587

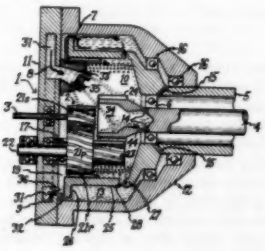
ATTITUDE INSENSITIVE LUBRICATION SYSTEMS

George A. Finn, III, Dalton, Mass.; James E. Kuneman, Liverpool, N.Y., and Keith E. Lawrence, Lanesborough, Mass., assignors to General Electric Company, Schenectady, N.Y.

Filed Sep. 10, 1981, Ser. No. 301,101

Int. Cl.³ F16H *57/04*; F01M *9/00*

U.S. Cl. 74—467 **6 Claims**



1. In a gearbox, an improved lubrication system comprising:

a centrifugal pump component composed of the combination of:

(a) a rotating drumlike element of the included gear train surrounding other active gear train elements and receiving lubricant centrifugally discharged by rotation of those other elements,

(b) the portion of the gearbox casing surrounding said rotating portion and

(c) the annular space defined between said drumlike element and said portion constituting a lubricant collection reservoir and a dynamic annulus within said casing partially separated from each other by a portion of said drumlike element which also imparts a circular flow of lubricant in said dynamic annulus, said drumlike element also having a plurality of fluid flow passages there through to cause said drumlike portion to act as a centrifugal separator to deaerate a contained lubricant and to fill and pressurize said collection reservoir with deaerated lubricant when said gear train is operating to cause said dynamic annulus to be charged with lubricant under pressure;

an additional pressurized reservoir separated from said dynamic annulus by portions of said casing;

at least one flow diverter in said casing for shunting flow of a contained fluid lubricant from said dynamic annulus to said additional pressurized reservoir as flow of said lubricant in said annulus is caused by rotation of said gear train elements;

one or more fluid dispensers inside said casing having at least one fluid spray outlet fed from said additional pressurized reservoir, said outlets metering and directing flow of said lubricant to elements of said gear train; and

flow paths in said gear train for continued flow of fluid dispensed from said outlets to critical elements in response to rotational forces;

whereby said dynamic pump and other rotating elements set up fluid flow patterns which overcome gravitational forces to provide flow patterns irrespective of attitude.

4,429,588

STEERING WHEEL FOR A MOTOR VEHICLE, PARTICULARLY FOR A TRACTOR

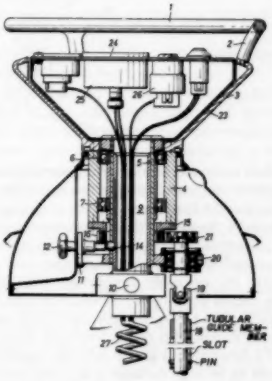
Horst Emundts, Bochum; Manfred Hoyer, Bergisch Gladbach, and Walter Vogel, Cologne, all of Fed. Rep. of Germany, assignors to Klöckner-Humboldt-Deutz Aktiengesellschaft, Cologne, Fed. Rep. of Germany

Filed Feb. 19, 1981, Ser. No. 236,126

Claims priority, application Fed. Rep. of Germany, Feb. 29, 1980, 3007726

Int. Cl.³ B62D *1/18, 1/20*

U.S. Cl. 74—484 R **4 Claims**



1. A steering device for a motor vehicle, comprising in combination:

a steering wheel rim;

steering wheel spokes connected to said rim;

a steering shaft;

a dish-shaped part which is arranged between said spokes and said steering shaft to effect operative connection thereof, said dish-shaped part serving as a transfer member for the rotary movements which serve for the steering, said dish-shaped part having sides which extend at an acute angle to a radial plane passing through said part so that said dish-shaped part tapers toward said steering shaft;

a support received within said dish-shaped part;

a stationary plate connected to said support and arranged in, and spaced from, said rim for receiving indicator instruments;

a fixed part on which said dish-shaped part is rotatably journalled;

a first gear rigidly connected with said dish-shaped part; and

a second gear fixedly connected to said steering shaft, said first gear meshing directly or indirectly with said second gear, said support for said stationary plate being an inner dish-shaped part which is mounted to that side of said sleeve facing said rim, said inner dish-shaped part con-

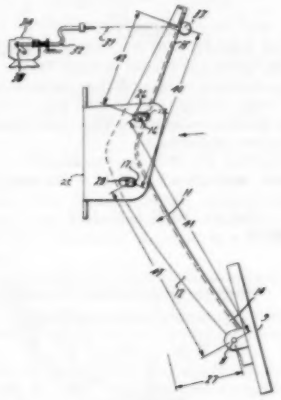
forming in shape to the shape of said first mentioned dish-shaped part and being installed therein so as not to contact therewith, that part of said inner dish-shaped part remote from said sleeve supporting said stationary plate as a termination of said inner dish-shaped part.

4,429,589

DUAL RATIO ACCELERATOR PEDAL ASSEMBLY

Raymond Stocker, West Bloomfield, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Jul. 1, 1982, Ser. No. 394,210
Int. Cl.³ G05G *1/14*
U.S. Cl. 74—513 **13 Claims**



9. A dual ratio accelerator arm assembly, comprising:

(a) an accelerator arm having a force applying portion at one extremity and a load receiving portion operatively engaging the engine's throttle at the other extremity;

(b) first and second pivot pins carried by said arm at longitudinally spaced locations along said arm; and

(c) bracket for operably supporting said arm, said bracket having means defining a pair of pivot pin receptacles, each receptacle being respectively associated with one of said pins, said receptacles being arranged so that upon application of a force to said arm at said force applying portion, the arm will be moved through a first arc with said first pivot pin engaging a side of a first receptacle associated therewith to constitute a first fulcrum for said arm, and further movement of said arm through a second arc causing said second pivot pin to engage a side of the other receptacle to constitute a second fulcrum for said arm while said first pin undergoes lost motion within said first receptacle.

4,429,590

PARKING BRAKE ACTUATOR MECHANISM

Leonard F. Kopich, Madison Heights, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 26, 1981, Ser. No. 247,727
Int. Cl.³ G05G *5/06*
U.S. Cl. 74—535 **3 Claims**

1. In a motor vehicle having a vehicle operator seat including a seat upper surface defining the seat level, and a hand operated parking brake actuating mechanism mounted along one side of the seat and below seat level, said parking brake actuating mechanism comprising:

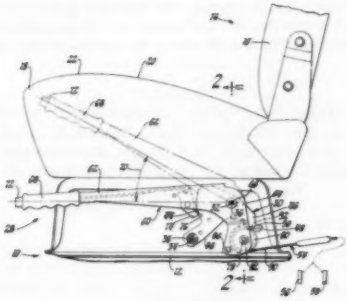
a fixed mounting bracket having an arcuate sector, an arm providing means for attaching one end of a flexible cable thereto, and a first pivot point;

a brake lever handle assembly pivotally mounted on said bracket at said first pivot point for generally vertical planar pivoted movement alongside said seat and only within an arc wherein the handle assembly remains below the level of the seat upper surface throughout the arc, said handle assembly including:

a lever arm including a hand grip adapted to be moved arcuately about said first pivot point by the vehicle operator to apply and release a parking brake, said lever arm having an established length between said hand grip and said first pivot point,

means for selectively latching and releasing said handle assembly by engagement and disengagement with said arcuate sector,

said handle assembly further having a second arm movable arcuately about said first pivot point with said lever arm and having a second pivot point thereon and an established length between said first and second pivot points which is less than said lever arm established length, a pulley rotatably mounted on said second arm at said second pivot point to provide a mechanical advantage established by the relationship of the length



of said lever arm between said hand grip and said first pivot point to the lesser length of said second arm between said first and second pivot points;

and a flexible tension force transmitting brake actuating cable having one end secured to said fixed bracket by said attaching means, said cable passing around an arcuate substantially semi-circular portion of said pulley and extending tangentially therefrom to a cable output portion adapted to be operatively connected to the parking brake, said cable output portion moving linearly to apply the parking brake for a distance equal to at least twice the arcuate distance moved by said second pivot point when said lever arm is moved arcuately to apply the parking brake so that full travel of said cable output portion for full parking brake application is obtained by movement of said lever arm within said arc wherein said brake lever handle assembly remains below the level of the seat upper surface, whereby to facilitate unencumbered entry and exit to and from the vehicle operator seat over said brake lever handle assembly by the vehicle operator.

4,429,591

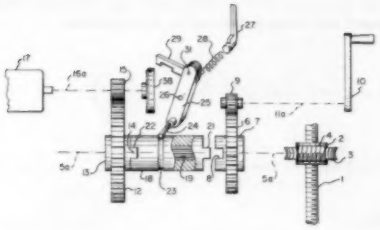
DRIVE SHIFTING APPARATUS FOR VALVE CONTROL AND THE LIKE

Howard W. Zuch, Sugar Land, and Paul Weber, Alvin, both of Tex., assignors to Eim Company, Inc., Missouri City, Tex.

Continuation of Ser. No. 20,167, Mar. 13, 1979, abandoned. This application Apr. 9, 1981, Ser. No. 252,322
Int. Cl.³ F16H *35/00*; F16K *31/02*
U.S. Cl. 74—625 **8 Claims**

1. Drive shifting apparatus for a valve control and the like comprising motor means, a motor input member, a hand input member, an output member, a clutch member shiftable between a position coupling the motor input member to the output member and a position coupling the hand input member

to the output member, spring means urging the clutch member to the position coupling the motor input member to the output member independently of operation of the hand input member, cam means driven by the motor means, said cam means being mounted on an axis separate from the axial mounting of the clutch member and driven directly from the motor means, and



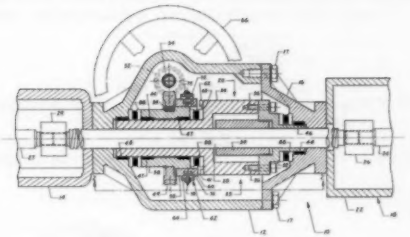
latch means engaging the cam means when the clutch member is shifted to position coupling the hand input member to the output member, said latch means being disengaged by operation of the cam means whereby motor operation restores the clutch member to position coupling the motor input member with the output member.

4,429,592

VALVE OPERATOR

Thomas E. Stevenson, Willoughby Hills, Ohio, assignor to The Babcock & Wilcox Company, New Orleans, La.

Filed Jun. 5, 1981, Ser. No. 270,948
Int. Cl.³ F16K *31/14*
U.S. Cl. 74—625 **8 Claims**



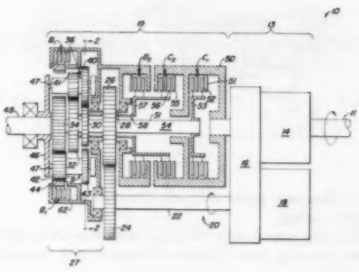
1. A valve operator comprising a frame, a valve actuating shaft mounted for stroking within said frame, including at least a portion which defines a ball screw, first drive means in constant engagement with and operable to stroke said shaft, second drive means operable to stroke said shaft and being selectively engageable with said shaft in any operative position thereof including a ball nut in constant engagement with said shaft having a clutch output member attached to said ball nut, means for selectively driving said ball nut to stroke said shaft, a clutch input member normally disengaged from said clutch output member, engaging means operable to engage said input member with said output member, first manually operable means attached to said input member and operable to rotate said input member, and means connected to said engaging means to move said engaging means between a first position wherein said input and output members are disengaged and a second position wherein said input and output members are engaged.

4,429,593

FULL RANGE HYDROMECHANICAL TRANSMISSION

Richard A. Michael, Waterloo, Iowa, assignor to Deere & Company, Moline, Ill.

Filed Jul. 25, 1980, Ser. No. 172,364
Int. Cl.³ F16H *47/04, 37/06, 57/10*
U.S. Cl. 74—687 **15 Claims**



8. An improved full range hydromechanical transmission for connection to a driven input shaft, comprising:

(a) a reversible, variable speed, hydrostatic drive unit including:

(i) a variable displacement drive section connected to and driven by said driven input shaft,

(ii) a bi-directional fixed displacement driven section, and

(iii) manifold means interconnecting said variable displacement drive section and said bi-directional fixed displacement driven section for directing a fluid medium therebetween;

(b) a compound planetary gear set having input and output ends comprising three sun gears coaxially aligned with each other and the input shaft including a first sun gear adjacent the input end, a third sun gear adjacent the output end and a second sun gear between the first and third sun gears; a first set of cluster gears with each cluster gear having a first planet gear and a second planet gear, each of said first planet gears meshing with said first sun gear having a diameter unequal to the diameter of the second planet gears, and each of said second planet gears meshing with said second sun gear; a second set of cluster gears with each cluster gear having a third planet gear and a fourth planet gear, each of said fourth planet gears meshing with one of said first planet gears and each of said third planet gears meshing with said third planet sun gear; a ring gear meshing with said third planet gears; and a rotatable carrier rotatably supporting said first and second sets of cluster gears;

(c) a rearwardly extending rotatable output shaft securely attached to said rotatable carrier;

(d) rotatable means connecting said bi-directional fixed displacement driven section to said first sun gear comprising an auxiliary shaft connected to and driven by said bi-directional fixed displacement driven section, a first gear mounted on said auxiliary shaft, and a second gear coaxially attached to said first planet sun gear and meshing with said first gear;

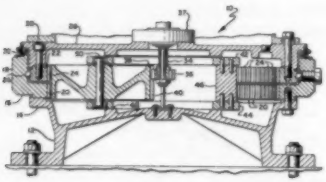
(e) selectively engageable means for connecting said driven input shaft to said third sun gear;

(f) selectively engageable means for connecting said driven input shaft to said second sun gear;

(g) selectively engageable means for preventing rotation of said ring gear; and

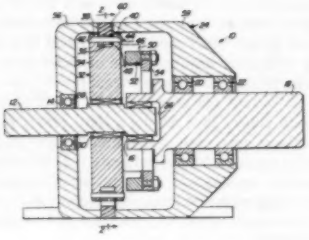
(h) selectively engageable means for preventing rotation of said second sun gear.

4,429,594
PLANETARY SPEED REDUCER
Werner H. Heller, West Valley, N.Y., assignor to UMC Industries, Inc., Stamford, Conn.
Filed Apr. 27, 1981, Ser. No. 257,928
Int. Cl.³ F16H 3/44
U.S. Cl. 74—788 9 Claims



1. A planetary speed reducer, comprising:
a gear casing;
a first ring gear fixedly mounted with respect to said casing;
a second ring gear rotatably mounted with respect to said casing;
said ring gears having different numbers of teeth, different pitch diameters, equal internal diameters and equal base pitches;
a sun gear rotatably mounted with respect to said casing;
at least one planetary gear having a common set of teeth for simultaneous mating engagement with said first and second ring gears and with said sun gear; and wherein
said first and second ring gears have an addendum difference that is equal to one-half their difference in pitch diameters.

4,429,595
MOTION TRANSMITTING DEVICE
Roger P. Butterfield, Freeville, N.Y., assignor to Emerson Electric Co., St. Louis, Mo.
Filed Oct. 23, 1980, Ser. No. 199,788
Int. Cl.³ F16H 1/28
U.S. Cl. 74—804 3 Claims



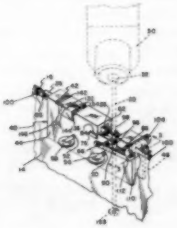
1. A motion transmitting device comprising:
an input shaft and a coaxial output shaft;
an eccentric connected to said input shaft;
a circular carrier suppported by and rotatable about said eccentric such that its periphery follows an orbital path upon rotation of said eccentric;
a fixed internal gear surrounding said carrier, said gear having a plurality of equally spaced teeth defined between spaces having a shape of a part of an ovoid, the defining pitch circle of said teeth being concentric with the axes of said shafts;
a plurality of equally spaced engaging means supported by said carrier with at least a portion of each being freely rotatable about its support axis, each engaging means sequentially engaging each of said teeth defining spaces and rolling on at least a portion of the defining surface thereof, the number of teeth being greater than the number of engaging means by at least one;
some of said engaging means being in torque transmitting engagement with the teeth for substantially an arc of 90° of said gear at any given time;
said gear teeth form being determined by plotting equal radii from a set of points representing the support axis of an engaging means at different positions occupied within a tooth space, the X-Y coordinates of the engaging means support axis being generated by the equations

$$X = E\cos C + F\cos\left(\left[\frac{A}{B} - 1\right] \times C\right)$$

$$Y = E\sin C - F\sin\left(\left[\frac{A}{B} - 1\right] \times C\right)$$

where
A=the number of gear teeth
B=the number of engaging means
E=the eccentricity of the input shaft
F=the pitch radius of the carrier
C=the angle of the engaging means relative to the eccentricity and joining the plotted points; and
coupling means between the carrier and the output shaft for translating orbital motion from said carrier to rotary motion to said output shaft.

4,429,596
ROTARY STEEL FILING APPARATUS FOR SHARPENING SAW CHAINS
Albert A. Southard, R.R. #3, Council Grove, Kans. 66846
Filed Jan. 22, 1982, Ser. No. 341,771
Int. Cl.³ B23D 63/10, 63/16
U.S. Cl. 76—36 15 Claims



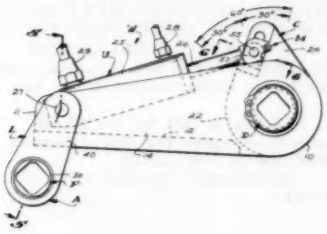
1. Apparatus for sharpening a saw chain comprising a channel-shaped body that includes an elongated horizontally extending web having laterally spaced depending flanges adapted to receive therebetween an upper horizontal portion of a chain saw bar having a saw chain entrained thereabout, penetration limiting means carried by the body and adapted to engage a chain saw bar to limit upward movement of the latter whereby clearance between a saw chain and the web is assured, means carried by the body for releasably holding a chain saw bar disposed between the flanges against relative movement, said body having a window recess in the top thereof affording a view of space between the flanges from above, with said recess being bounded as to its lowermost extent by horizontal coplanar surfaces of the flanges spaced vertically below the vertical extent of the web, and saw chain engaging means disposed in the space between the flanges adjacent the lowermost extent of the window recess for limiting lateral movement of a saw chain between the flanges, and said surfaces being provided with means facilitating guidance of a sharpening tool in the sharpening of a saw chain tooth.

4,429,597

HYDRAULIC TORQUE WRENCH

Bosko Grabovac, Arcadia, and Ivan N. Vuceta, Walnut, both of Calif., assignors to Consolidated Devices, Inc., City of Industry, Calif.

Filed Jan. 8, 1982, Ser. No. 338,068
Int. Cl.³ B25B 13/00
U.S. Cl. 81—57.39 13 Claims



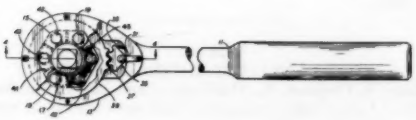
1. A power torque wrench comprising an elongate rigid frame with front and rear ends and with laterally outwardly, upwardly and downwardly disposed sides, an elongate laterally extending output shaft with opposite ends rotatably carried by the frame at the front end portion thereof with its opposite ends accessible at opposite sides of the frame, a torque transmitting work engaging part at a selected one end of the shaft and projecting laterally outwardly from one side of the frame, power operated drive means carried by the frame and engaged with the shaft to rotate the shaft and said part; an elongate reaction anchoring means with an inner end pivotally connected with the rear end portion of the frame, an outer end spaced from the frame and including an elongate laterally extending axially shiftable and rotatable post on an axis parallel with and spaced from the shaft, support structure engaging parts at the ends of the post and projecting laterally outwardly from and accessible at the opposite sides of the frame.

4,429,598

REVERSIBLE WRENCH

Howard F. Tucker, 53 Fall Clove, R.D. 1, Delancey, N.Y. 13752

Filed Nov. 12, 1981, Ser. No. 320,294
Int. Cl.³ B25B 13/00
U.S. Cl. 81—59.1 3 Claims



1. A reversible wrench comprising:

a handle having an enlarged body at one end with a cavity therein having a polygonal cross section, said polygonal cross-section including a plurality of pairs of continguous flat side walls, each pair of contiguous flat surfaces forming an outwardly extending apex, said enlarged body having two outside flat parallel surfaces;

a drive member located within said cavity;

a plurality of rollers disposed between said drive member and said cavity, the number of rollers being equal to the number of pairs of contiguous flat side walls forming apexes;

a selector means including a flat ring rotatably mounted on one outside surface of said enlarged body with a plurality of separators rigidly secured thereto and extending between said cavity and said drive member, said selector further including a lever means for rotating said flat ring;

pairs of spring means located on opposite sides of said separators, each separator being located between two of said plurality of rollers; and

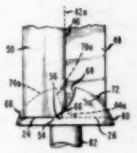
means for retaining said drive member, rollers, selector and spring means affixed to said handle.

4,429,599

ONE WAY SCREWDRIVER

James A. La Sante, Sr., 733 Revere Ave., Bronx, N.Y. 10465

Filed Jan. 3, 1983, Ser. No. 455,324
Int. Cl.³ B25B 15/00
U.S. Cl. 81—436 6 Claims



1. A bit for bi-directional driving one-way fasteners comprising a longitudinally extending shank terminating in a flat front face disposed in a plane substantially normal to the axis of said shank, two longitudinally extending and diametrically opposed flutes provided in said shank and extending forwardly into intersecting relation with said front face, each of said flutes including first and second surfaces, said first surfaces respectively forming at the intersection with said front face first shoulders, a pair of second shoulders, a pair of third surfaces, each of said pair of third surfaces extending angularly between said front face and each of said second shoulders, said front face having first and second axes of symmetry disposed at right angles to each other and intersecting each other at the longitudinal axis of said shank, one of said first shoulders lying along a line positioned on one side of said second axis and disposed above and substantially parallel to said first axis, the other of said first shoulders lying along a line positioned on the other of said second axis and disposed below and substantially parallel to said first axis, one of said second shoulders lying along a line substantially coincident with said second axis and disposed above said first axis, the other of said second shoulders lying along the line substantially coincident with said second axis and disposed below said first axis, whereby said front face includes two sector-shaped and diametrically opposed wings and a narrow connecting bridge, said pair of third surfaces being disposed in said opposed wings.

4,429,600

TAMPER-PROOF SCREW ASSEMBLY

Bulent Gulistan, 20568 Pinnacle Way, Malibu, Calif. 90265

Filed Jun. 21, 1982, Ser. No. 390,245
Int. Cl.³ B25B 15/00
U.S. Cl. 81—461 6 Claims

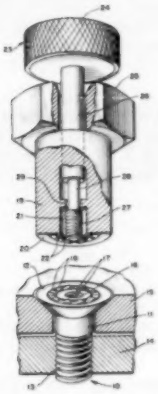
1. A tamper proof screw assembly, including in combination:

(a) a screw having a flat head defining first and second engaging means;

(b) a torquing member having a flat bottom defining a third engaging means positioned to cooperate with said second engaging means when positioned over said head, said second and third engaging means comprising annular arrays of teeth respectively, the teeth having symmetrical sloping sides so that when engaged and a turning torque is applied in either direction, the teeth tend to cam each other out of engagement; and

(c) an axial force applying member having a fourth engaging means for engaging said first engaging means on said flat

head in a manner to apply an axial force on said torquing member to hold said second and third engaging means together and thereby prevent any camming out of engagement



of said second and third engaging means to enable torque to be transferred from said torquing member to said screw when securing or removing the screw.

4,429,601

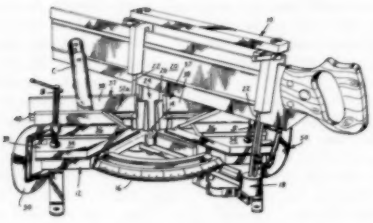
METHOD OF MITERING MOLD AND THE LIKE

Elizabeth C. Taylor, 1989 Queens Way, NE., Atlanta, Ga. 30341

Division of Ser. No. 105,031, Dec. 19, 1979, Pat. No. 4,346,636. This application Feb. 24, 1982, Ser. No. 351,824

Int. Cl.³ B27G *5/02*

U.S. Cl. 83—13 **10 Claims**



1. In a method of supporting a decorative mold and the like having a mold face and cutting said mold along a predetermined line, such as back-mitering a strip of mold, on a substantially flat base having a saw thereon which may be set as to angularity of cut and controlled during sawing to move in a predetermined path, the steps comprising:

supporting a profile support means which comprises a profile support member having a profile face with length and width corresponding to the length and width of the portions of the mold face and the like,

providing a means for supporting said profile support means at a predetermined, preselected angle on said base including the angle at which a mold is installed,

retaining said profile support means in position on said base and causing said profile support means to support the mold at the angle corresponding to the angle of installation,

placing said mold coextensively into engagement with the profile face of the profile support member and maintaining said engagement,

positioning the top of the mold adjacent to and supporting same by an upper part of the profile support member and the bottom of said mold against said profile support member at a location toward said base spaced from said upper part,

cutting said mold while retaining said profile support member and said mold in engagement during cutting,

and removably retaining said profile support means on said flat base.

4,429,602

METHOD OF CROSSCUTTING A WEB AND STACKING THE CUT SHEETS, AND IMPACT-TYPE CROSSCUTTER FOR WEBS WITH SHEET STACKER

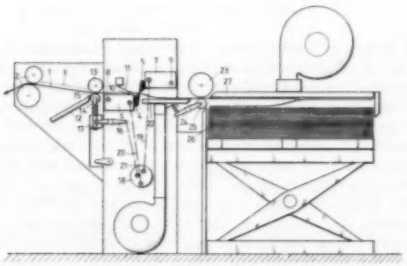
Hilmar Vits, Leichlingen, Fed. Rep. of Germany, assignor to Vits-Maschinenbau GmbH, Langenfeld, Fed. Rep. of Germany

Filed Aug. 24, 1981, Ser. No. 295,278

Claims priority, application Fed. Rep. of Germany, Sep. 4, 1980, 3033245; May 29, 1981, 3121414

Int. Cl.³ B26D *7/00*; B65H *35/04*

U.S. Cl. 83—24 **21 Claims**



1. A method of crosscutting a web and stacking the resultant sheets which comprises continuously feeding said web toward a cutter, decelerating the feed of said web at the cutting point for the duration of the cutting operation, while continuing the feed toward said cutter at the same rate whereby a back-up occurs in the feed direction, cutting said web, causing the new head end of the web so formed upon said cutting to overlap the tail end of the resultant cut sheet on the conveying path, conveying said sheet to a sheet stack, after said cut sheet is moved onward to said sheet stack at normal conveying speed increasing the conveying speed of the web toward said cutter until the web portion which has backed up ahead of the cutting point has been stretched taut and caused to overlap the tail end of the cut sheet.

4,429,603

ROTARY ENVELOPE CUTTING METHOD

William A. Chapman, Jr., Hubbardston, and John J. Crowley, Ware, both of Mass., assignors to Westvaco Corporation, New York, N.Y.

Division of Ser. No. 198,464, Oct. 20, 1980, abandoned. This application May 14, 1982, Ser. No. 378,279

Int. Cl.³ B31B *19/14*

U.S. Cl. 83—37 **7 Claims**

1. A method of converting rectangular sheet material blanks to envelope configuration using rotary cutter rolls, said method comprising the steps of:

A. Cutting a first series of first proportioned rectangular sheets from a continuous web supply;

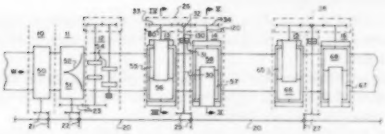
B. Serially transporting said first rectangular sheets along a laterally fixed feed path;

C. Cutting opposite side top end corners of said first rectangular sheets with respective first and second cutting knives to form a top flap and top edges of symmetric side flaps;

D. Cutting opposite side bottom end corners of said first rectangular sheet with respective third and fourth cutting knives to form bottom edges of said symmetric side flaps and an integral bottom and back flap which, when folded, extends from the bottom end of an envelope to the top end;

E. Changing the lateral cutting position of said cutting knives relative to said fixed feed path, said first and third knives on one side of said feed path and said second and fourth knives on the other side thereof;

F. Cutting a second series of second proportioned rectangular sheets from a continuous web supply;



G. Cutting opposite side top end corners of said second rectangular sheets with said respective first and second cutting knives to form a top flap and top edges of asymmetric side flaps, one of said side flaps forming an integral back flap which, when folded, extends across the back of an envelope substantially from side to side; and,

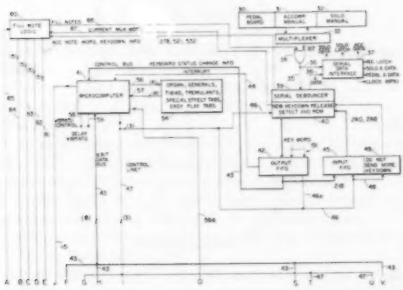
H. Cutting opposite side bottom end corners of said second rectangular sheet with said third and fourth cutting knives to form bottom edges of said assymetric side flaps and a bottom flap.

4,429,604

FILL NOTE GENERATION SYSTEM FOR MICROCOMPUTER CONTROLLED ORGAN

Gary A. Eck, Jasper, and Gary R. Fritz, Ferdinand, both of Ind., assignors to Kimball International, Inc., Jasper, Ind.

Filed Jun. 22, 1981, Ser. No. 276,067
Int. Cl.³ G10H *3/06*
U.S. Cl. 84—1.17 **27 Claims**



1. An electronic keyboard musical instrument comprising:

a keyboard having a plurality of playing keys actuating respective keyswitches and comprising a solo portion customarily played by the right hand and an accompaniment portion customarily played by the left hand, each of the keys of said keyboard corresponding to at least one note having a particular pitch and octave value,

multiplexer means for scanning the keyswitches of the solo portion of the keyboard and generating on an output a serial time division multiplexed solo data stream comprising a plurality of time slots corresponding to the keys of the solo portion of the keyboard and keydown signals in time slots corresponding to depressed ones of the keys of the solo portion,

a plurality of independently controllable accompaniment tone generator-keyer means each capable of independently generating any one of a plurality of the tones corresponding to the keys of the accompaniment portion of the keyboard, there being fewer accompaniment tone generator-keyer means than keys of the accompaniment portion of the keyboard,

assignment means interposed between the accompaniment portion of said keyboard and said plurality of accompaniment tone generator-keyer means and responsive to the actuation of keys on the accompaniment portion of the keyboard for capturing one or more of said tone generator-keyer means and transmitting one or more control signals to assign said captured tone generator-keyer means to generate respective tones corresponding to the notes associated with an acutated key or keys on the accompaniment portion of the keyboard, and

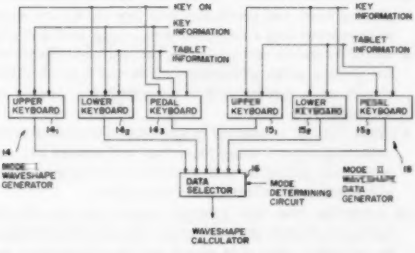
fill note generator means responsive to the tone assignments of the captured accompaniment tone generator-keyer means by said assignment means and responsive to the occurrence in the solo data stream of a keydown signal corresponding to the first scanned actuated key in the solo portion of the keyboard for inserting keydown signals in time slots of the solo data stream corresponding to the respective pitches of tones produced by at least some of the assigned accompaniment tone generator-keyer means and lying within the next octave following the time slot of said first scanned actuated key, and tone producing means responsive to the solo data stream for producing tones corresponding to the keydown signals in the solo data stream.

4,429,605

ELECTRONIC MUSICAL INSTRUMENT

Kiyomi Takauji, Hamamatsu, Japan, assignor to Kabushiki Kaisha Kawai Gakki Seisakusho, Japan

Filed Oct. 28, 1981, Ser. No. 315,982
Claims priority, application Japan, Oct. 28, 1980, 55-151123
Int. Cl.³ G10H *1/08, 1/36, 7/00*
U.S. Cl. 84—1.17 **1 Claim**



1. An electronic musical instrument which is provided with a plurality of keyboards, each having a plurality of keyswitches, a plurality of tone select switches and an assignor for detecting and assigning the on-off state of the key switches and the tone select switches and in which the amplitude value at each sampling point is computed by a Fourier calculation

method to obtain a desired waveshape with the output from the assignor, the electronic musical instrument comprising:

first means for synthesizing a waveshape which undergoes variations with time after the depression of one of the key switches;

second means for synthesizing, for a newly depressed one of the key switches and a key switch already depressed by a change in the on-off state of one of the tone select switches, a waveshape which does not undergo variations with time after the new key depression; and

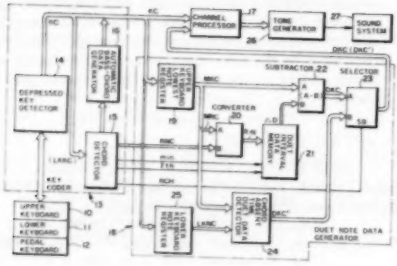
means for controlling the first and second means so that the first means repeatedly carries out a waveshape calculation and so that the second means carries out a waveshape calculation upon occurrence of one of the depression of another one of the key switches and change in the on-off state of the tone selected switches.

4,429,606

ELECTRONIC MUSICAL INSTRUMENT PROVIDING AUTOMATIC ENSEMBLE PERFORMANCE

Eiichiro Aoki, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Jun. 22, 1982, Ser. No. 390,952
Claims priority, application Japan, Jun. 30, 1981, 56-100459
Int. Cl.³ G10H *1/02, 1/38*
U.S. Cl. 84—1.17 **4 Claims**



1. An electronic musical instrument comprising:

a first keyboard section having first keys respectively for playing notes and producing first key identifying signals each representing a depressed key among said first keys;

a second keyboard section having second keys respectively for playing notes and producing second key identifying signals each representing a depressed key among said second keys;

a chord detector connected to said second keyboard section detecting a chord being played on said second keyboard section according to said second key identifying signals and producing a chord identifying signal;

an ensemble note data generator connected to said first keyboard section and said chord detector for producing an ensemble note data signal which represents a note which is apart from the note being played on said first keyboard section by a note interval determined from the detected chord and the played note on said first keyboard section according to a predetermined logic; and

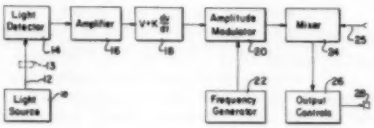
a tone generator means for generating tones of notes represented by said first key identifying signal, said second key identifying signal and said ensemble note data signal.

4,429,607

LIGHT BEAM MUSICAL INSTRUMENT

Frank Meno, Pittsburgh, Pa., assignor to University of Pittsburgh, Pittsburgh, Pa.

Filed Mar. 30, 1982, Ser. No. 363,411
Int. Cl.³ G10H *1/34, 1/46*
U.S. Cl. 84—1.18 **13 Claims**



1. A light beam musical instrument comprising:

at least one light source,

at least one light detector positioned for receiving light from the light source and converting variations therein to electric signals,

a signal sensitive amplifier which amplifies electrical signals in accordance with signal variations and is wired to receive electrical signals from the detector,

said signal sensitive amplifier having means for transforming a signal received from said light detector into a transformed signal which is related to both the extent of interruption or reflection of a light beam from said light source and the rapidity of such interruption or reflection action,

modulator means for receiving output signals from said signal sensitive amplifier,

a frequency generator electrically connected to said modulator means,

a speaker operatively associated with said modulator means, and

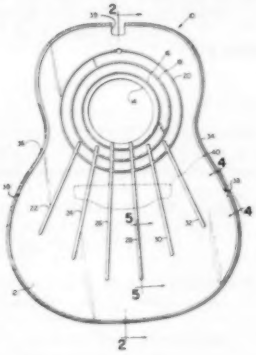
said modulator means include an amplitude modulator for receiving output from said signal sensitive amplifier.

4,429,608

STRINGED MUSICAL INSTRUMENT TOP

Charles H. Kaman, Prattling Pond Rd., Farmington, Conn. 06032, and C. William Kaman, II, 201 Riverside Dr., Morganton, N.C. 28655

Filed Jul. 20, 1981, Ser. No. 285,070
Int. Cl.³ G10D *3/02*
U.S. Cl. 84—291 **17 Claims**



1. A stringed musical instrument top comprising a single piece of plastic material defining a relatively thin sounding board having a sound hole therethrough between its upper and lower ends, a plurality of integral reinforcing ribs projecting from the inner surface of said sounding board, said reinforcing

ribs including a plurality of annular ribs surrounding said sound opening and a plurality of rectilinear ribs extending longitudinally of said sounding board between said sound hole and said lower end, each of said rectilinear ribs intersecting at least one of said annular ribs.

4,429,609

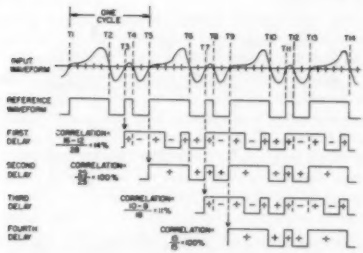
PITCH ANALYZER

David J. Warrender, 2685 Burnside Rd., Sebastopol, Calif. 95472

Continuation-in-part of Ser. No. 330,681, Dec. 14, 1981. This application Feb. 3, 1982, Ser. No. 345,441

Int. Cl.³ G10G *7/02*; G01R *23/02*

U.S. Cl. 84—454 **15 Claims**



1. A device for determining the pitch of an audio input signal comprising:

means responsive to said audio input signal for generating a reference waveform having transitions corresponding to the zero crossings of said audio input signal whereupon said reference waveform includes a first transition of a given sense and a plurality of succeeding transitions of the same given sense at a corresponding plurality of time intervals relative to said first transition;

means for determining the correlation between said reference waveform and each of a plurality of effectively delayed waveforms, each of which corresponds to said reference waveform delayed by one of said time intervals;

means for selecting a subset of said plurality of time intervals, each member of which yields an effectively delayed waveform having a correlation above a predetermined threshold; and

means responsive to said subset of time intervals for determining a characteristic period for said reference waveform.

4,429,610

SHELL RELOADER

Robert W. Mantel, N80 W23090 Plainview Rd., Sussex, Wis. 53089

Filed Dec. 7, 1981, Ser. No. 327,775

Int. Cl.³ F42B *33/12*

U.S. Cl. 86—36 **8 Claims**

1. In an automatic shell reloader of the type having a fixed platen and a movable die platen with a slide in the fixed platen to move used shell casings in a step-by-step manner to a number of dies on the die platen; the improvement comprising

a primer cap storage reservoir on the fixed platen,

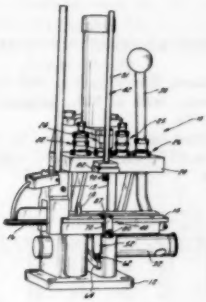
a primer cap slide assembly mounted for reciprocal motion on the fixed platen, and

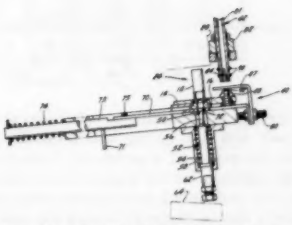
a primer cap storage assembly mounted on said die platen above said reservoir, said primer cap slide assembly being positioned to move the bottom primer cap in said reservoir to an opening in the fixed platen below a shell casing on the fixed platen, said primer cap storage assembly including

a storage tube and

means at the lower end of said storage tube for retaining primer caps in the tube,

means mounted on said storage reservoir in a position to release said retaining means on the end of the storage tube and allow the bottom primer cap in the tube to drop into





the reservior when the die platen is moved toward the fixed platen, and

guard means on said primer cap slide assembly to block the space above the reservoir when said slide assembly is moved into the platen.

4,429,611

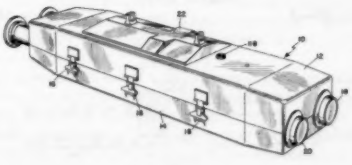
AIRBORNE MISSILE LAUNCHER

Delbert J. Oldham, Chino, and John A. Karish, Alta Loma, both of Calif., assignors to General Dynamics, Pomona Division, Pomona, Calif.

Filed Jan. 29, 1982, Ser. No. 344,097

Int. Cl.³ F41F *3/04*

U.S. Cl. 89—1.816 **25 Claims**



16. An airborne missile launcher for air launching of man-portable tube-launched missiles, said launcher comprising:

a central support frame including attachment means for attachment to an aircraft;

clamp means for releasably clamping a plurality of missile containing launch tubes to said support frame;

electronic control means mounted on said support frame and including electrical connecting means for automatic interconnection with electronic means in said launch tubes upon clamping said launch tubes in place;

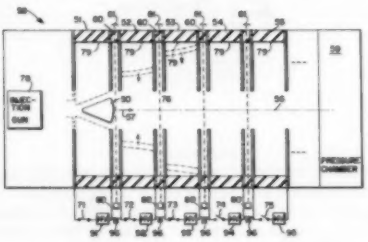
aerodynamic shell means for enclosing said support frame and said electronic control means, said aerodynamic shell includes an upper fixed half-shell and a lower removable half-shell enclosing said support frame and at least a major portion of missile launch tubes mounted in said clamp means.

4,429,612

METHOD AND APPARATUS FOR ACCELERATING A SOLID MASS

Derek A. Tidman, Silver Spring, and Yeshayahu A. Goldstein, Potomac, both of Md., assignors to GT - Devices, Alexandria, Va.

Filed Jun. 18, 1979, Ser. No. 49,557
Int. Cl.³ F41F *1/00, 1/02;* G21B *1/00*
U.S. Cl. 89—8 **84 Claims**



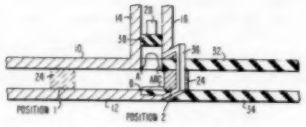
1. A method of accelerating a solid mass along a predetermined path, said mass having an axis initially positioned at a point on the path and a peripheral cross sectional surface region surrounding, but not intersecting the axis, the axis moving along the path during acceleration, comprising the steps of imploding a plasma discharge toward the path in response to current flowing in the plasma, the plasma arriving on the region of the surface to impart force components to the mass along and normal to the path and accelerate the mass along the path, and synchronizing the imploding of the plasma with the acceleration of the mass along the path so the arrival of the plasma on the region is matched with movement of the projectile along the path.

4,429,613

ELECTROMAGNETIC PROJECTILE LAUNCHER WITH AN AUTOMATIC PLASMA FORMATION DEVICE

Daniel W. Deis, Churchill Borough; Ian R. McNab, Murrysville Boro, both of Pa., and Joseph L. Smith, Jr., Concord, Mass., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 15, 1981, Ser. No. 283,582
Int. Cl.³ F41F *1/00*
U.S. Cl. 89—8 **14 Claims**



1. An electromagnetic projectile launching system comprising:

a first pair of conducting rails;

a conductive armature slidably disposed between said first pair of rails;

a source of current;

means for connecting said current to said first pair of rails, thereby propelling said armature along said first pair of rails and striking an arc when said armature breaks contact with said first pair of rails;

a second pair of conducting rails located adjacent said first pair of rails at the point where said arc is formed, and electrically connected to said first pair of rails; and

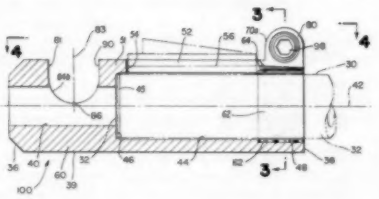
means for transferring, without extinguishing, said arc into a gap between said second pair of conductors, where said arc acts as a plasma armature for propelling a projectile.

4,429,614

SLIP ON COMPENSATOR FOR REVOLVERS

Charles T. Tocco, 436 N. Mercy Springs Rd., #127, Los Banos, Calif. 93635

Filed Feb. 13, 1981, Ser. No. 234,272
Int. Cl.³ F41C *21/18*
U.S. Cl. 89—14 C **9 Claims**



1. A compensator device for controlling the recoil of an associated gun having a gun body means and a gun barrel, said gun barrel having an outer diameter, a gun sight on said outer diameter adjacent the one end and a bore formed therein, said compensator device comprising:

a cylindrical body member having one end and an opposite end, said cylindrical body member further having an outer diameter, a first internal passage extending from said one end towards said opposite end, a second internal passage larger than said first internal passage extending from said opposite end toward said one end, a counter-bore adjacent said opposite end, said counterbore being larger than said second internal passage and further being centrally located therewith and a radial shoulder portion interposed said one end and said opposite end and formed between said first and second internal passages, said first internal passage having an internal diameter of substantially constant diametral dimension and being greater than the said bore formed in the gun barrel, said second internal passage having an internal bore of substantially constant diametral dimension and being greater than the outer diameter of said gun barrel, said second internal passage further being concentric with said first internal passage;

an annular resilient insert member mounted on said outer diameter of said gun barrel and in said counterbore of said cylindrical body member;

securing means, mounted adjacent to said opposite end of said cylindrical body member, for detachably securing said cylindrical body member to said gun barrel so as to place said internal diameter of said first internal passage of said cylindrical body member in substantial axial alignment with said bore of said gun barrel, said securing means further comprising clamping means, formed in said opposite end of said cylindrical body member, for clamping said cylindrical body member to said gun barrel such that said second internal passage of said cylindrical body member is in frictional engagement with outer diameter of gun barrel, said clamping means further comprising:

a. a pair of bosses extending from said outer diameter of said cylindrical body member adjacent to said opposite end, said pair of bosses further being substantially parallel and spaced apart from each other, one of said bosses having a portion defining a first aperture, said first aperture having an axis which is substantially perpendicular to the longitudinal axis of said second internal

passage, the other of said bosses having a portion defining a second aperture centrally aligned with respect to said first aperture, said second aperture having screw thread means formed therein; and

b. a screw thread fastener member inserted through said first aperture and threadably engaging said screw thread means in said second aperture, said screw thread fastener member having a head larger than said first aperture, said head abutting against the one of said bosses so that when said screw thread fastener member is rotated to further engage said screw thread means in said second aperture, said screw thread fastener member draws the one of said bosses towards the other of said bosses to compress said annular resilient insert member and clamp said outer diameter of said gun barrel; and

venting aperture means formed through the wall of said cylindrical body member interposed said one end and radial shoulder portion, said venting aperture means including a portion generally contained within a vertical plane passing through the axis of said bore of said gun barrel when said gun is held in a generally horizontal firing position, such that when said gun is fired, the gases generated during the ignition of a related bullet assembly freely escape said one end of said gun barrel, unrestricted by said structural relationship established between the gun barrel and said one end of said cylindrical body member toward said venting aperture means and pass therethrough, thereby creating reaction forces assisting in maintaining the fired gun stable.

4,429,615

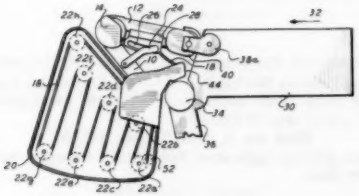
ARTICULATED FEEDER

Philip E. Morris, Irvine, Calif., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 16, 1982, Ser. No. 369,313

Int. Cl.³ F41D *10/14*

U.S. Cl. 89—33 BB **14 Claims**



1. A feeder for transferring ammunition from a magazine to a loading assembly of an elevationally rotatable gun, comprising:

a first chute pivotally mounted about said magazine;

a second chute articulated between said first chute and said loading assembly, said chutes being sized to provide an internal passage for said ammunition;

endless transfer means for circulating along an interior path from said magazine through said chutes to drive said ammunition therethrough, said endless means returning from said interior path to said magazine along a return path; and

linkage means coupled to said endless means along its return path for drawing it inwardly as said chutes unfold.

4,429,616

APPARATUS FOR TRANSPORTING AMMUNITION TO A TOP-MOUNTED GUN

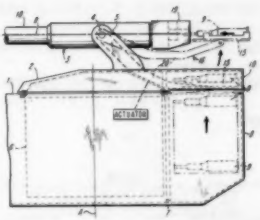
Heinrich Grosser, Vellmar, Fed. Rep. of Germany, assignor to Thyssen Industrie AG Henschel, Kassel, Fed. Rep. of Germany

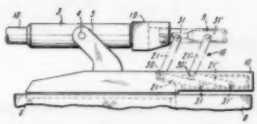
Continuation of Ser. No. 68,868, Aug. 22, 1979, abandoned. This application Jan. 19, 1982, Ser. No. 340,713

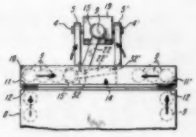
Claims priority, application Fed. Rep. of Germany, Aug. 26, 1978, 2837303

Int. Cl.³ F41H *7/06*

U.S. Cl. 89—36 K **11 Claims**







1. Apparatus for storing rounds of ammunition and loading the rounds in a gun having a breech and a barrel wherein the gun is mounted on and above an armored turret for rotation about a horizontal axis with respect thereto to elevate the barrel and wherein the turret is mounted on an armored enclosure for rotation about a vertical axis with respect thereto to swivel the barrel with respect to the armored enclosure, the apparatus comprising:

a main magazine located within the armored enclosure for storing the rounds of ammunition in parallel vertical columns within the armored enclosure;

a standby magazine positioned in the turret behind and beneath the breech of the gun, the standby magazine being operatively independent of the elevation of the gun and being rotatable in and out of alignment with the main magazine; the standby magazine having first and second sections extending parallel to said horizontal axis, the first and second sections being covered with armor and being separated by a space aligned with a gap in the armor plate through which gap the rounds are delivered to the breech of the gun, and means included in the first and second sections for moving the rounds horizontally to the space so that the rounds may be lifted through the gap in the armor plate to the breech of the gun;

lifting means mounted on said turret and movable operatively independent of the elevation of said gun, means for moving the lifting means vertically between a first position within the space for receiving rounds from the standby magazine and a second position behind the breech of the gun for charging the gun with the round, and

means for transferring rounds from the main magazine to the standby magazine when the turret is rotated to position the standby magazine in alignment with the main magazine.

4,429,617

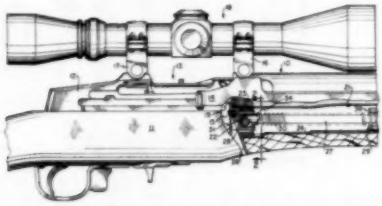
RECIPROCATING SLIDE DAMPENING MECHANISM FOR FIREARMS

William B. Ruger, Southport, Conn., assignor to Sturm, Ruger & Company, Inc., Southport, Conn.

Filed Oct. 23, 1981, Ser. No. 314,458

Int. Cl.³ F41C *27/00*

U.S. Cl. 89—198 **4 Claims**



1. In a firearm having a reciprocating slide positioned forward of the receiver in a slide channel and associated with a rod the improvement comprising

(a) the rod having a dampening head attached to its rearward end;

(b) a recessed floating block means positioned in the slide channel forward of the receiver for receiving the rod dampening head;

(c) floating block mounting means for mounting the floating block to permit limited movement of the floating block in the slide chamber;

(d) spring means on the rod urging the rod rearwardly;

(e) cam means on the rod dampening head to engage the mounting means through the urging of the spring means to position the block in a forward position;

(f) face means on the block for engagement with the slide as it moves rearwardly to move the block to a rearward position on its mounting means causing the rod dampening head and attached rod to be moved forwardly to compress the spring means

whereby block movement rearwardly, dampening head rod movement forwardly and spring means compression absorb energy from the rearwardly moving slide.

4,429,618

HYDRAULIC ROLL-ADJUSTMENT APPARATUS

Friedrich Klute, Kreuztal, and Robert Fender, Essen, both of Fed. Rep. of Germany, assignors to Fried. Krupp Gesellschaft mit beschränkter Haftung, Essen, Fed. Rep. of Germany

Filed May 20, 1981, Ser. No. 265,441

Claims priority, application Fed. Rep. of Germany, May 24, 1980, 3019947

Int. Cl.³ F01B *25/26, 7/20*

U.S. Cl. 91—1 **5 Claims**

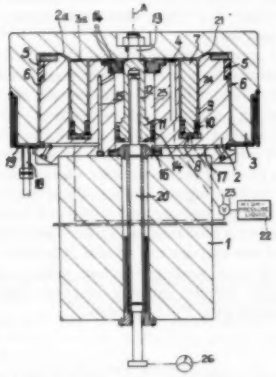
1. A hydraulic adjustment apparatus for use in a roll stand, the apparatus comprising:

a cylinder forming a first cylinder chamber and having a first cylinder surface directed backward in a predetermined direction in said first chamber;

a first piston displaceable relative to the cylinder forward and backward in said direction in said first chamber and having in said chamber a forwardly directed first piston face of a predetermined first piston area, said first piston being formed with at least one second chamber open forward in said direction at said first face;

a second piston displaceable forward and backward in said direction in said second chamber and having a forwardly directed end engageable with said first cylinder surface and a second piston face of a predetermined second piston area substantially smaller than said first piston area and directed backward in said second chamber;

means for alternately pressurizing said chambers at the respective piston faces in any relative axial position of said



pistons and cylinder with liquid under substantially the same high pressure, whereby when said second chamber is thus pressurized said first piston and cylinder will be urged apart with substantially less force than when said first chamber is thus pressurized, said first piston being formed with a third chamber extending in said direction; and

a third piston fixed to said cylinder and engaged in said third chamber, said third piston having a forwardly directed third piston face in said third chamber, said means being connected to said third chamber to pressurize same with said fluid at said high pressure.

4,429,619

CONTROL SYSTEM FOR A HYDRAULIC LOAD

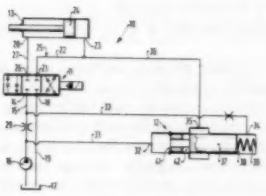
Volkmar Leutner, Birkbuschstr. 11, 7251 Friolzheim, and Berthold Pfuhl, Graf-Hartmann-Str. 65, 7145 Markgröningen, both of Fed. Rep. of Germany

Filed Apr. 4, 1980, Ser. No. 137,987

Claims priority, application Fed. Rep. of Germany, May 12, 1979, 2919206

Int. Cl.³ F15B *13/042*

U.S. Cl. 91—29 **12 Claims**



1. A control system for a hydraulic load, including a source of pressure fluid, at least one intake port to the load, at least one pressure conduit for connecting the source to the intake port

and an electrohydraulically operated main control valve arranged in said pressure conduit to direct the pressure fluid to said hydraulic load, said system comprising a measuring throttle connected in said pressure conduit; an auxiliary circuit including an auxiliary control valve having a slider; two end spaces cooperating respectively with the ends of said slider and an intermediate control space connected to said intake port in parallel with said measuring throttle and said main control valve in said pressure conduit; a biasing spring within one of said two end spaces for unilaterally adjusting the slider into a flow blocking rest position; a first branch conduit connected between the inlet of said measuring throttle and one space of said auxiliary valve; a second branch conduit connected between the outlet of said measuring throttle and the other end space of said auxiliary valve and when pressure differences across said measuring throttle is low, some of the pressure fluid is directed through the first branch to maintain the slider in the flow blocking rest position and when pressure differences across said measuring throttle is high, some of the pressure fluid is directed through the second branch to move the slider from the flow blocking rest position to an open position to allow some of the pressure fluid through the slider to the hydraulic load which controls said slider in proportion to pressure differences across said measuring throttle to maintain the hydraulic load in a fixed position.

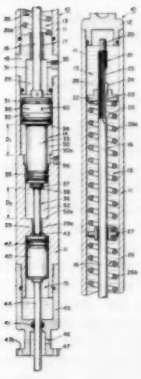
4,429,620
HYDRAULICALLY OPERATED ACTUATOR

Joseph A. Burkhardt; Thomas W. Childers, both of New Orleans, La.; Harry R. Hanson, Houston, Tex., and Bobby M. Harkrider, Gretna, La., assignors to Exxon Production Research Co., Houston, Tex.

Continuation of Ser. No. 13,941, Feb. 22, 1979, abandoned. This application Jul. 27, 1981, Ser. No. 287,004

Int. Cl.³ F15B *13/042*

U.S. Cl. 91—395 **37 Claims**



1. Apparatus comprising:

a housing having an inner wall and containing at least two linearly spaced-apart chambers;

a piston arranged for reciprocation in one of said chambers in a power stroke and in a return stroke;

reciprocative means connected to said piston for movement therewith and extending from said one chamber into said other chamber;

an annular space formed between said reciprocative means and the inner wall of said housing; and

metal seal ring means operable to seal upon compression sealing off fluid communication between said chambers only at the completion of the power stroke and at the completion of the return stroke of said piston, said metal seal ring means comprising two metal seal ring units, one of said seal ring units being resiliently compressed to close off said annular space and seal off fluid communication between said chambers at the completion of the power stroke of said piston and the other of said metal seal ring units being resiliently compressed to close off said annular space and seal off fluid communication between said chambers at the completion of the return stroke of said piston.

4,429,621
HYDRAULIC SYSTEMS

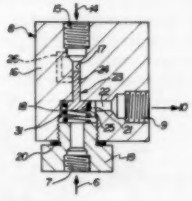
Frederick J. Adams, Avon, England, assignor to Cam Gears Limited, Hertfordshire, England

Continuation-in-part of Ser. No. 962,677, Nov. 21, 1978, abandoned. This application Apr. 20, 1981, Ser. No. 255,557

Claims priority, application United Kingdom, Nov. 24, 1977, 48959/77

Int. Cl.³ F15B *11/08, 13/04;* **F16K** *31/12*

U.S. Cl. 91—420 **2 Claims**



1. An apparatus for use in a power steering system having a pump to supply fluid under pressure to actuate a motor which turns a steerable vehicle wheel, said apparatus comprising a steering control valve having means for receiving fluid under pressure from the pump and means for transmitting a return fluid flow which is conducted from a power steering motor to a reservoir during turning movement of the steerable wheel, restrictor means for throttling the return fluid flow from the steering control valve as a function of the output pressure from the pump, said restrictor means having an inlet port for receiving the return fluid flow from said steering control valve, an outlet port through which the return fluid flow is discharged from said restrictor means, a throttle chamber connected in fluid communication with said inlet and outlet ports, a movable throttle member, said throttle member having a head portion and a stem portion, said head portion of said throttle member being disposed in said chamber and being movable from a first position toward one of said ports to restrict the flow of fluid from said inlet port to said outlet port, an annular stop surface disposed in said chamber opposite from said one of said ports, said head portion of said throttle member having an annular rim with a first side surface which is disposed in engagement with said stop surface when said throttle member is in the first position, a coil spring disposed in said chamber and urging said throttle member toward the first position, said coil spring engaging a second side surface of said annular rim on said head portion of said throttle member and circumscribing said one of said ports so that the return fluid flow enters said chamber through said inlet port and passes between turns of said coil spring before flowing from said chamber through said outlet port, means for exposing an end surface on said stem portion of said throttle member to fluid pressure conducted from the output of the pump to urge said head portion of said throttle member toward said one of said ports against the influence of said coil spring with a force which varies as a function of variations in the fluid pressure conducted from the pump to effect movement of said throttle member toward said one of said ports when a pressure differential between the stem and head portions of said throttle member exceeds a predetermined amount, and surface means defining a passage in which said

stem portion of said throttle member is disposed, said passage having a length which is greater than the length of said stem portion, said stop surface being disposed adjacent to one end of said passage, the end surface on said stem portion being disposed in said passage between said one end of said passage and the opposite end of said passage, said opposite end of said passage being connected in communication with the outlet fluid pressure from said pump.

4,429,622

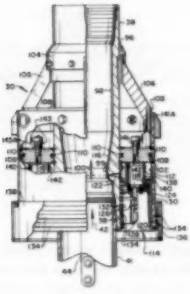
PRESSURE RESPONSIVE ACTUATOR FOR USE WITH AN AUTOMATIC DUMP VALVE

Donald F. Taylor, Dallas, Tex., assignor to Sedco, Inc., Dallas, Tex.

Division of Ser. No. 58,927, Jul. 19, 1979, Pat. No. 4,300,585. This application Sep. 15, 1980, Ser. No. 187,425

Int. Cl.³ F01B *19/00*

U.S. Cl. 92—93 **3 Claims**



1. A pressure responsive actuator comprising, in combination:

a first elongated tubular housing defining a longitudinally extending flow passage and having a sidewall portion constricting the flow passage thereby defining a venturi flow region;

a second elongated tubular housing mounted in spaced relation around the first elongated tubular housing and sealed at one end thereof defining an annular cavity;

a piston assembly disposed for movement through said annular cavity, said piston assembly including an annular piston member slidable with respect to an outer wall of said first tubular housing and an inner bore wall of said second tubular housing, said piston assembly including seal means interposed between said piston member and said outer and inner walls, respectively, thereby dividing the annular cavity into first and second pressure chambers; and

said sidewall portion of the first elongated tubular housing having an opening connecting the first pressure chamber in fluid communication with the venturi flow region, and the second pressure chamber being adapted for connection to an external fluid pressure source.

4,429,623

COFFEE-MAKING MACHINE

Ernesto Illy, 8, via Locchi, I - Trieste, Italy

Filed Apr. 19, 1982, Ser. No. 369,516

Claims priority, application Italy, Jul. 16, 1981, 22376/81[U]

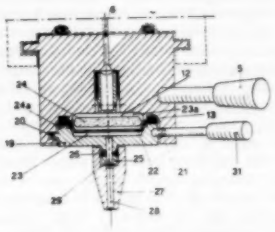
Int. Cl.³ A47J *31/24*

U.S. Cl. 99—295 **9 Claims**

1. In a coffee machine heretofore adapted to brew coffee by passing hot water from a distributor through a quantity of ground coffee loosely placed in a filter inside a receptacle, a combination comprising:

a removable adapter adapted to replace said receptacle and permit said coffee machine to brew coffee using a prepackaged, water-permeable coffee pod;

connecting means for connecting the adapter to the distributor of the machine; and



a removable box adapted to be connected to the adapter and define therewith an extraction chamber into which said coffee pod may be inserted prior to connection of said box to said adapter.

4,429,624

STIRRING ARRANGEMENT

Maynard W. Linn, 6336 N. Bergeron, Fresno, Calif. 93704

Filed Mar. 25, 1982, Ser. No. 362,022

Int. Cl.³ A47J *27/00*

U.S. Cl. 99—348 **15 Claims**

1. In an improved stirring arrangement, the improvement comprising, in combination:

a container for containing materials to be stirred, a handle for said container, a lid for said container, a handle for said lid, a pair of grooved pulleys mounted on the lid for rotational movement, a first of said pair of grooved pulleys having a first diameter, the second of said pair of grooved pulleys having a second diameter smaller than the first diameter, and said pair of grooved pulleys mounted on a common axle, a belt means engaging the grooves of the pair of pulleys to impart rotary motion thereto comprised of an alloy of nickel and titanium, said belt having a predetermined configuration, a take-up idler pulley mounted on the lid for rotational movement spaced apart from said pair of grooved pulleys to direct said belt from said first grooved pulley to said second grooved pulley, said take-up idler pulley mounted on a first shaft, said take-up idler pulley increasing in temperature above a predetermined first temperature whereby said take-up idler pulley transfers thermal energy to said belt to increase the temperature of said belt above the crystalline phase change temperature of said alloy comprising said belt for the condition of the container subjected to heat input, a return idler pulley mounted on said handle for rotational movement to direct said belt from said second grooved pulley to said first grooved pulley, said return idler pulley mounted on a second shaft, means to decrease the temperature of said return idler pulley below the predetermined second temperature whereby said return idler pulley absorbs thermal energy from said belt whereby said belt is reduced in temperature below the crystalline phase change temperature

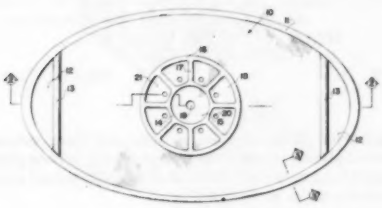
of said alloy comprising said belt, stirring means extending into the container for stirring the contents of said container, and coupling means for coupling said stirring means to said first shaft.

4,429,625

COOKING SHEET AND LIFTER FOR POULTRY, MEAT AND THE LIKE

Robert H. Nelson, Calgary, Canada, assignor to R. H. Nelson Holdings Ltd., Calgary, Canada

Filed Jan. 18, 1982, Ser. No. 340,511
Int. Cl.³ A47J *37/06*
U.S. Cl. 99—425 8 Claims



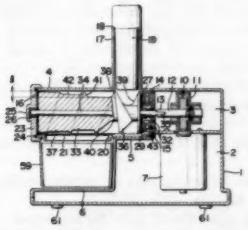
1. A combination cooking sheet and lifter for meat, poultry and the like comprising a substantially flat sheet of relatively heavy duty aluminum foil which includes ends, lifting handle portions formed at each end thereof, drainage apertures through said sheet substantially centrally thereof and liquid collecting and guiding areas formed around said drainage apertures, said sheet being flexible thereby cradling the meat or poultry when lifting same from the cooking medium said lifting handle portions including a removed portion of the foil sheet adjacent each said end and inboard of the outer periphery of said sheet thereby defining hand engaging apertures.

4,429,626

JUICE EXTRACTOR DEVICE

Keisuke Ihara, Kasukabe; Kazuo Toda, Tokyo, and Shozi Hoshino, Sagamihara, all of Japan, assignors to Tokyo Electric Co., Ltd., Tokyo, Japan

Filed Apr. 30, 1981, Ser. No. 258,900
Int. Cl.³ A23N *1/02*
U.S. Cl. 99—510 1 Claim



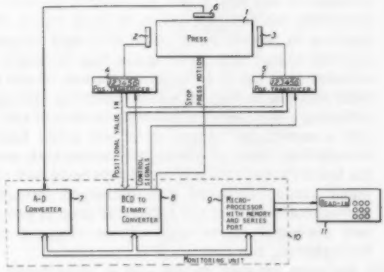
1. A juice extractor device comprising a juice extractor body which has a base end, an outer end, an upper side, a lower side, and a bore therewithin extending between said ends and having a horizontal axis, said body having an inlet port near said base end and on said upper side, a juice discharge port in said lower side below said axis and extending from near said outer end to near said base end, a residuum discharge port in said upper side above said axis and near said outer end, said bore having a substantially conical inner surface which is disposed concentrically with respect to said axis and increasing in diameter from said base end to said outer end of said body, a filter provided in said juice discharge port and having an inner surface the curvature of which is substantially the same as that of said inner surface of said bore, and a rotary body which is rotatably disposed in and extends along substantially the entire length of said bore of said juice extractor body in such a manner that said rotary body is opposed to all of said ports, said rotary body having its axis coincident with said horizontal axis of said bore and having an outer circumferential surface which has a spiral compressing portion and a spiral blade positioned adjacent said inlet port, said spiral blade having a valley formed therealong which increases sharply in diameter in the direction toward said outer end of said body, said compressing portion comprising a spiral wing continuing from said spiral blade, said spiral wing having a valley formed therealong which increases gradually in diameter in the direction toward said outer end of said body, a gap between said valley of said wing of said spiral compressing portion and the inner surfaces of said bore of said juice extractor body and said filter being established at not more than 6 mm along a major portion of its length and a gap between said spiral wing and said inner surfaces being established at not more than 2 mm, said gaps decreasing gradually in the direction toward said outer end of said juice extractor body.

4,429,627

METHOD AND APPARATUS FOR MONITORING A PRESS

Lennart Edsö, Remmaregränd 3, S-222 51 Lund, Sweden

PCT No. PCT/SE82/00175, § 371 Date Jan. 12, 1983, § 102(e) Date Jan. 12, 1983, PCT Pub. No. WO82/04010, PCT Pub. Date Nov. 25, 1982
PCT Filed May 17, 1982, Ser. No. 459,571
Claims priority, application Sweden, May 19, 1981, 8103121
Int. Cl.³ B30B *15/28*
U.S. Cl. 100—35 5 Claims



1. A method for safe-guarding a press by monitoring the press motion, wherein the press force exerted by the press is continuously sensed during each pressure stroke; wherein reference force values are produced by registration during a first pressure stroke or calculation as an average for several pressure strokes of the instantaneous values of the sensed press force at each one of mutually subsequent positions of the one press platen of the press in relation to its other press platen; wherein the instantaneous values of the force, for pressure strokes executed after the reference force values have been produced, are compared with the produced reference force values at each one of the mutually subsequent positions of the one press platen in relation to the other press platen during the entire pressure stroke; and wherein the press motion is directly discontinued if, on comparison, the sensed force value in any position deviates from the reference force value of that position by more than a predetermined amount.

4,429,628
EXTRACTION DEVICE

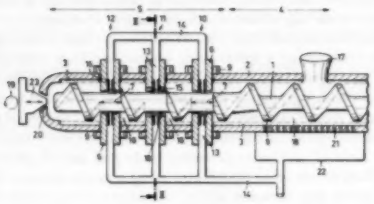
Klaus Koch, Laatzen, and Gerhard Syrbius, Grossburgwedel, both of Fed. Rep. of Germany, assignors to Hermann Berstorff Maschinenbau GmbH, Hanover, Fed. Rep. of Germany

Filed Dec. 2, 1981, Ser. No. 326,477

Claims priority, application Fed. Rep. of Germany, Dec. 9, 1980, 3046384

Int. Cl.³ B30B *9/14*

U.S. Cl. 100—117 **10 Claims**



1. Apparatus for separating liquid components from solid components of a liquid-solid mixture, comprising

(a) a hollow press barrel defining a relatively low pressure feed region and a relatively higher pressure pin-barrel region,

(b) a drivable screw rotatable in said barrel, said screw having a longitudinal axis, a base, and a screw flight helically disposed thereon, said screw flight being formed with axially spaced gaps extending radially entirely around the screw base in the areas of said gaps,

(c) a plurality of radially inwardly directed pins passing into said pin-barrel region of said press barrel, the radially inner ends of said pins extending substantially to said base of said screw thread in the regions of said axial gaps and forming narrow radial gaps with said screw base, the presence of said pins in said pin-barrel region effecting a substantial buildup of pressure in such region thereby resulting in the release of liquid from said mixture, the diameter of each said pin being less than the length of the adjacent axial gap so as to permit rotation of said screw, each said pin having an axially extending throughbore including a first, open end adjacent the base of said screw and a second end remote from said screw base, said throughbores being at substantially atmospheric pressure, the radial dimension of said radial gaps being such that the liquid can be extracted and discharged through said throughbores without any substantial drop in pressure in said pin-barrel region and without clogging of said throughbores, and

(d) discharge network means, also at substantially atmospheric pressure, in fluid flow communication with said second end of each said bore.

4,429,629
PRESS CONSTRUCTION

Frank W. Leonard, P.O. Box 5634, Boise, Id. 83705

Filed Oct. 13, 1981, Ser. No. 310,617

Int. Cl.³ B30B *7/00*

U.S. Cl. 100—226 **21 Claims**

1. A press construction comprising

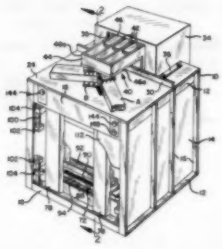
(a) a vertical support frame having top, bottom, front, rear and side portions,

(b) a top reinforced surface on said frame forming a first platen surface,

(c) a second platen assembly movable vertically in said support frame,

(d) a carriage supported on said second platen assembly having a surface forming a second platen surface arranged to cooperate with the first platen surface for pressing articles,

(e) said carriage having movement on said second platen assembly between a pressing position over said first platen surface and a retracted position,



(f) and drive means disposed between said frame and said second platen assembly arranged to lift said second platen assembly to open said press and to pull said second platen assembly down to close said press.

4,429,630
PRINTING MACHINE MILLING ROLLER DRIVE SYSTEM

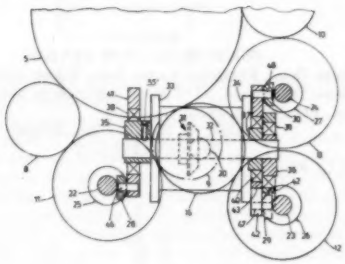
Josef Hajek, Friedberg, Fed. Rep. of Germany, assignor to M.A.N.-ROLAND Druckmaschinen Aktiengesellschaft, Offenbach am Main, Fed. Rep. of Germany

Filed Jan. 24, 1983, Ser. No. 460,309

Claims priority, application Fed. Rep. of Germany, Feb. 4, 1982, 3203803

Int. Cl.³ B41F *13/12, 7/26*

U.S. Cl. 101—216 **5 Claims**



1. In a rotary printing machine having

a frame (**21**);

a plate cylinder (**5, 6, 7**) and gear means (**18**) rotating therewith,

a drive system for a plurality of axially oscillating milling rollers (**11, 12, 13**)

comprising, in accordance with the invention,

means (**22, 23, 24**) for rotatably journalling the milling rollers while permitting axial excursion;

a central gear (**16**) driven to rotate with the plate cylinder gear means (**18**);

a central drive shaft (**20**) driven by the central gear;

a plurality of drive gears (**11', 12', 13'**) meshing with said central gear and providing rotation for respectively associated milling rollers (**11, 12, 13**);

a right-angle drive (**31**) coupled to rotate with the shaft (**20**) of the central gear (**16**) and having an output shaft (**32**);

a plurality of circumferentially adjustable rotatable eccenters (**35, 36, 37**),

one for each milling cylinder, secured to the output shaft (32);

connecting rod means (41, 42, 43) journalled on the eccenter at one end thereof and converting rotary movement of the eccenter into linear movement;

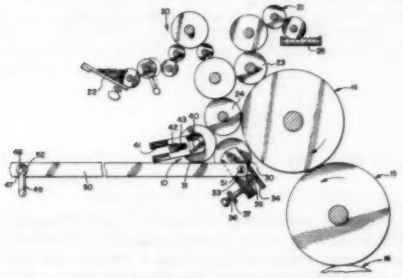
and engagement coupling means (46, 47, 48; 28, 29, 30; 25, 26, 27) coupling the other end of the respective connecting rods to the respective milling rollers for longitudinal oscillatory movement thereof in the rhythm of rotation of the plate cylinder.

4,429,631

AUXILIARY INKING ROLLER KIT FOR DUPLICATING PRESS

Louis P. Commers, Melrose Park, Ill., assignor to Suburban Duplicator Repair, Inc., Franklin Park, Ill.

Filed Sep. 13, 1982, Ser. No. 417,144
Int. Cl.³ B41F 31/00
U.S. Cl. 101—349 3 Claims



1. An auxiliary inking roller kit for mounting on a duplicating press having a master cylinder rotatably mounted between opposed side plates and an ink system for applying ink to the master cylinder, said ink system including upper and lower form rollers engaging said master cylinder, an ink fountain, and a series of ink transfer rollers between said ink fountain and said form rollers, said ink roller kit comprising a pair of opposed mounting plates mountable on said side plates in fixed relation thereto, a pair of rollers, means rotatably mounting said rollers on and between said mounting plates and for movement of the axes of said pair of rollers relative to the axis of the master cylinder, one of said rollers being an auxiliary form roller for engagement with said master cylinder below said lower form roller, the other of said rollers being in engagement with said auxiliary form roller and said lower form roller to transfer ink from said lower form roller to said auxiliary form roller, and means for selectively moving the auxiliary form roller into and out of engagement with said master cylinder independently of the lower form roller so that said auxiliary form roller can be removed from contact with said master cylinder while said lower form roller remains in contact with said master cylinder.

4,429,632

DELAY DETONATOR

Malak E. Yunan, Boonton Township, Morris County, N.J., assignor to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Filed Apr. 27, 1981, Ser. No. 257,974
Int. Cl.³ C06C 7/00; F42C 19/10, 19/12
U.S. Cl. 102—202.13 18 Claims

1. A delay detonator comprising a tubular metal detonator shell integrally closed at one end and closed at the other end by an ignition assembly for igniting a train of charges therein, and containing, in sequence from its integrally closed end,

(a) base charge of a detonating explosive composition;

(b) a priming charge of a heat-sensitive detonating explosive composition;

(c) a pressed delay charge of an exothermic-burning composition; and

(d) a loose pulverulent, flame-sensitive ignition charge separating said delay charge from said ignition assembly, said

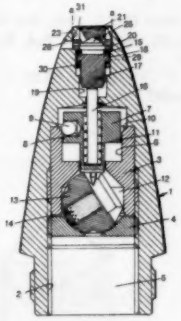
loose ignition charge (1) having a free surface adapting it to be unrestrained in the direction of said ignition assembly and (2) being adapted to be ignited in response to direct contact with flame emitted from the ignition of a charge in said ignition assembly.

4,429,633

IMPACT IGNITER

Sören Edelton, and Bo Peterson, both of Lindesberg, Sweden, assignors to Aktiebolaget Bofors, Bofors, Sweden

Filed Jun. 9, 1981, Ser. No. 271,763
Claims priority, application Sweden, Jun. 25, 1980, 8004682
Int. Cl.³ F42C 15/36
U.S. Cl. 102—222 16 Claims



1. An improved igniter for attachment to the forward end of a projectile, comprising:

a housing member adapted to be positioned at the forward end of a projectile, said housing member having a longitudinal axis, a forward end and a side wall;

a chamber within said housing member;

a fuse located in said chamber, said fuse comprising a material which will melt when air streams against it following firing of a projectile;

an arming mechanism located in said housing member and operatively associated with said fuse, said arming mechanism contacting said fuse and being held in an unarmed configuration by said fuse while said fuse remains intact;

at least one first channel means leading from the exterior of said igniter inward to said chamber, said channel means being angled rearwardly from said forward end of said

housing member toward said longitudinal axis, for leading a portion of the air streaming past the exterior of said igniter after firing of an associated projectile into said chamber and into contact with said fuse to cause said fuse to melt and to permit said arming mechanism to assume its armed configuration; and

at least one second channel means leading from said chamber outward to the exterior of said igniter, for leading said portion of air back to the exterior of said igniter.

4,429,634

ADHESIVE LINER FOR CASE BONDED SOLID PROPELLANT

James D. Byrd, and James O. Hightower, both of Huntsville, Ala., assignors to Thiokol Corporation, Chicago, Ill.

Continuation of Ser. No. 888,053, Mar. 20, 1978, abandoned, which is a continuation of Ser. No. 757,260, Jan. 6, 1977, abandoned. This application Mar. 12, 1980, Ser. No. 129,542

Int. Cl.³ F42B *1/00*

U.S. Cl. 102—290 **4 Claims**

4. A case bonded solid propellant rocket motor wherein said motor contains a bonded casing liner consisting essentially of hydroxy terminated polybutadiene and from about 1% to 10% of aziridine.

4,429,635

MINE, ESPECIALLY ANTITANK MINE

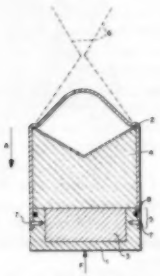
Wolfgang Dorn, Niederkassel-Lulsdorf; Fritz Elsner, Troisdorf-Sieglar; Klaus Fischer, Troisdorf, and Heinz Kroschel, Troisdorf-Sieglar, all of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany

Filed Oct. 2, 1981, Ser. No. 308,121

Claims priority, application Fed. Rep. of Germany, Oct. 4, 1980, 3037607

Int. Cl.³ F42B *23/04*

U.S. Cl. 102—401 **3 Claims**



1. A mine, especially an antitank mine, which can be laid on the ground surface by being dropped from the air and which impinges on the ground in a preferred impact direction, said mine comprising a detonator and an explosive charge located in a housing, said housing being subdivided into an operational part containing the detonator and into an active part containing the explosive, both the active and operational parts being coupled together by a shape-mating connection, and said shape-mating connection being severed when a predetermined impact load on said mine has been exceeded and thereupon the active part is separated from the operational part by the impact shock.

4,429,636

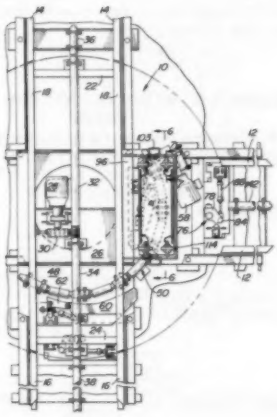
VEHICLE TURNTABLE

Barry L. Ziegenfus, Saylorsburg, Pa., assignor to SI Handling Systems, Inc., Easton, Pa.

Filed Dec. 14, 1981, Ser. No. 330,351

Int. Cl.³ B61J *1/02*; B61B *13/12*

U.S. Cl. 104—36 **15 Claims**



1. A turntable comprising a support, a table pivotably mounted on the support for movement about a vertical axis, said table having tracks for supporting a vehicle, said table having drive wheels depending therefrom, an arcuate drive tube assembly, said drive wheels being arcuately arranged about said axis for driving frictional contact with said assembly for causing said table to pivot about said axis, a drive motor coupled to aid drive tube assembly for rotating said drive tube assembly about its longitudinal axis, and latch means for latching said table in a position at the ends of its movement.

4,429,637

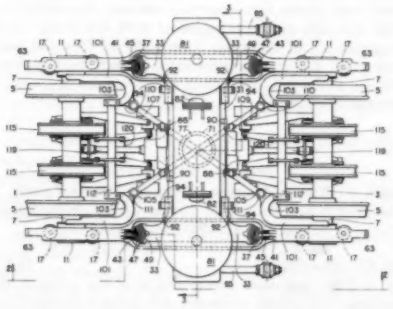
RAILWAY VEHICLE TRUCK

Keith L. Jackson, Granite City; Dallas L. Schmitt, Fairview Heights, and John L. Schauster, Highland, all of Ill., assignors to Lukens General Industries, Inc., Coatesville, Pa.

Filed Oct. 19, 1981, Ser. No. 312,994

Int. Cl.³ B61F *5/38, 5/30, 3/08*

U.S. Cl. 105—168 **17 Claims**



1. A radial axle railway vehicle truck comprising a pair of longitudinally spaced wheel and axle assemblies, each having an axle and a pair of railway flanged wheels fixedly mounted on its end portion, bearing assemblies each including a bearing

rotatably receiving an end of each of said axles outboard of said wheels and having upwardly facing horizontal surfaces fore and aft of the respective bearings, the surfaces nearest the ends of the truck being at a higher level than the axle centers and the surfaces remote from the ends of the truck being at a level lower than the respective axle centers, said upper surfaces being positioned at least in part transversely inboard of the bearing center and the lower surfaces being positioned at least in part transversely outboard of the bearing center, elastomeric pad devices seated on said bearing assembly surfaces and being correspondingly positioned inboard and outboard respectively with respect to said bearing center, longitudinally extending side frames at the respective sides of said truck having downwardly facing horizontal surfaces vertically aligned with said bearing assembly surfaces and seated on said pad devices, said pad devices being yieldable in shear to accommodate yawing movements of the respective axles relative to said side frames, said side frames each having a depressed central portion, end portions overlying the respective bearing assemblies and intermediate sloping portions connecting said overlying end portions and said depressed central portion, and a main frame resiliently supported on both said side frames by vertically yieldable resilient means and held thereby against substantial longitudinal and lateral movements with respect to said side frames.

4,429,638

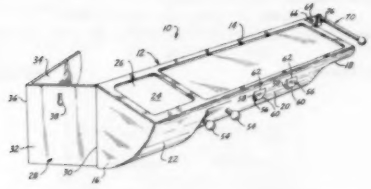
UTILITY SHELF

Yaffa Liĉari, Elberon, N.J., assignor to Basic Line, Inc., Cliffwood Beach, N.J.

Filed Jan. 15, 1982, Ser. No. 339,428

Int. Cl.³ A47B *85/00, 3/00, 67/02;* **A47F** *5/08*

U.S. Cl. 108—25 **10 Claims**



1. A plastic utility shelf, comprising a body, having a substantially flat top wall, a curved front wall, a pair of converging and diverging sidewalls, a storage well positioned in said body below an opening provided in said top wall, and a panel hingedly connected to said body such that said panel is pivotable between a closed position in which said panel extends into said body to form a rear wall and an inner sidewall of said storage well and an open position in which said panel is positioned outside said body to provide substantially complete access to said body from behind, whereby said shelf may be nested in another similar shelf when said panel is in its open position.

4,429,639

MONEY-DISPENSING DEVICE FROM A SAFE'S SPACE

Joachim Burchart, Schlangen, Fed. Rep. of Germany, assignor to Nixdorf Computer AG, Paderborn, Fed. Rep. of Germany

Filed Oct. 5, 1981, Ser. No. 308,230

Claims priority, application Fed. Rep. of Germany, Oct. 7, 1980, 3037839

Int. Cl.³ E06B *7/32*

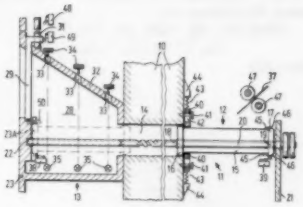
U.S. Cl. 109—19 **13 Claims**

1. A device for conveying objects such as bank notes and coins from a security area to a dispensing point through a safe wall comprising:

drawer means reciprocally movable from the security area to the dispensing point;

motor-powered drive means for moving the drawer upon enablement thereof between the security area and the dispensing point;

normally closed access means associated with the drawer means in the dispensing point and operable between closed and opened conditions;



first control means for automatically enabling the access means only when when the drawer means substantially fully reaches the dispensing point; and

second control means for automatically preventing the enabling of said motor powered drive means to return the drawer means to the security area until the drawer means is empty.

4,429,640

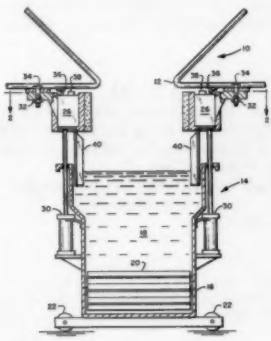
SUBMERGED SCRAPER CONVEYOR FURNACE TRANSITION PIECE

Robert P. Sullivan, Chattanooga, Tenn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Jun. 25, 1982, Ser. No. 392,411

Int. Cl.³ F23J *1/00*

U.S. Cl. 110—165 R **3 Claims**



1. In combination, a top-supported furnace in which an ash-bearing fuel is burned, opening means in the furnace bottom, a bottom supported tank open at its upper end and containing water positioned beneath the furnace opening means, into which the ash from the furnace falls, means for removing the ash from the tank, an intermediate transition piece, drive means carried by the tank for moving the transition piece between a first position spaced from the furnace bottom, and a second position in engagement with the furnace bottom, means for removably securing the transition piece to the furnace bottom, flexible seal means which completely surround the furnace bottom for sealing the space between the transition piece and the furnace bottom when the transition piece is in its second position, stop means for limiting the movement of the transition piece towards the furnace bottom to prevent the seal means from becoming crushed, and plate means carried by the transition piece which completely surround the furnace bot-

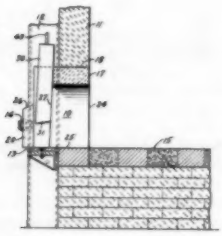
tom which coacts with a body of water carried by the tank for forming a water seal between the furnace bottom and the tank.

4,429,641

CERAMIC FURNACE DOOR AND FRAME

John D. Early, Hamburg, N.Y., assignor to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Dec. 30, 1981, Ser. No. 335,964
Int. Cl.³ F23M *5/00*
U.S. Cl. 110—181 **2 Claims**



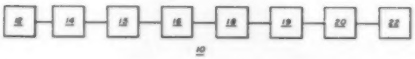
1. In a furnace having a hearth door and frame, the improvement comprising a one-piece cast ceramic door frame, said door frame including:
   (a) two sides, each of said sides having:
      (i) a front portion supported on a sill plate and a rear portion supported on a furnace sidewall;
      (ii) a front wall extending upwardly from said sill plate;
      (iii) a tapered back wall; and
      (iv) a recessed portion between said front wall and said back wall for slidably receiving a furnace door;
   (b) a hearth extending between said two sides; and
   (c) a door opening formed by said two sides and said hearth, said door opening flaring inwardly to widen on said furnace side.

4,429,642

THERMAL RECLAIMER APPARATUS FOR A THERMAL SAND RECLAMATION SYSTEM

Vagn Deve, East Washington, Pa., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Apr. 16, 1982, Ser. No. 369,334
Int. Cl.³ B09B *3/00*
U.S. Cl. 110—236 **9 Claims**



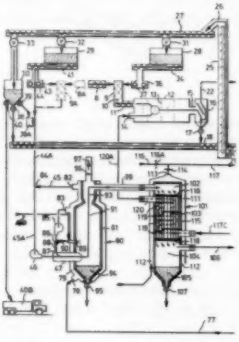
1. A thermal reclaimer apparatus for effecting the removal of organic matter from used foundry sand, which contains organic matter, metal of either a ferrous or nonferrous nature, dust and fines, comprising:
   a. means including a plurality of surfaces defining a chamber having a first opening formed in one of said plurality of surfaces and a second opening formed in another one of said plurality of surfaces, said chamber being operative to retain the used foundry sand therein while the used foundry sand is being heated to a predetermined temperature for a preestablished period of time in order to accomplish the burning away of organic matter contained in the used foundry sand;
   b. feed means cooperatively associated with said chamber, said feed means including a member supported for movement within said first opening of said chamber, said member embodying a cross-sectional area substantially equivalent to the cross-sectional area of said first opening such that said member essentially seals off said first opening when said member is positioned therewithin, said feed means being operative as a consequence of the movement of said member in said first opening to effect the injection into said chamber through said first opening of used foundry sand containing organic matter;
   c. burner means cooperatively associated with said chamber, said burner means including a burner pipe supported so as to project through said second opening a predetermined distance into said chamber, said burner pipe having a cross-sectional area less than the cross-sectional area of said second opening so as to provide an annular space surrounding said burner pipe through which the discharge of the used foundry sand from said chamber is effected, said burner means being operative to provide a hot gas flow into said chamber sufficient to selectively heat the used foundry sand to a first temperature when the used foundry sand contains metal of a ferrous nature and to a second temperature when the used foundry sand contains metal of a nonferrous nature for purposes of accomplishing the burning away of organic matter contained in the used foundry sand; and
   d. rotating means cooperatively associated with said chamber, said rotating means being operative to effect the rotation of said chamber as the used foundry sand in said chamber is being heated by the hot gas flow from said burner means.

4,429,643

APPARATUS AND METHOD FOR TREATING SEWAGE SLUDGE

John H. Mulholland, Bramalea, Canada, assignor to 456577 Ontario Limited, Toronto, Canada

Filed Jun. 12, 1981, Ser. No. 272,998
Claims priority, application Canada, Jun. 30, 1980, 355114
Int. Cl.³ F23G *7/04*
U.S. Cl. 110—238 **10 Claims**



1. A sewage sludge treatment system comprising
   (a) means for dewatering the sludge;
   (b) a rotary dryer for exposing dewatered sludge to hot gas;
   (c) a furnace for burning sludge from the dryer;
   (d) means for mixing part of the sludge from the dryer with dewatered sludge supplied to the dryer;
   (e) a first cyclone for separating solids from dryer discharge gas;
   (f) means for heating and circulating part of the dryer discharge gas back to the dryer, including a heat exchanger having a passage for furnace discharge gas and a separate passage for the circulating dryer discharge gas whereby the latter is heated by the furnace discharge gas without exposure to contaminants thereon;
   (g) means for delivering the remainder of the dryer discharge gas into the furnace for combustion therein

whereby no dryer discharge gas is discharged directly to the atmosphere;

(h) a first water scrubber for said remainder of dryer discharge gas delivered into the furnace, to reduce the moisture content of said remainder of dryer discharge gas by cooling;

(i) a second cyclone for separating solids from the furnace discharge gas emanating from the heat exchanger;

(j) a second water scrubber for further cleaning of the furnace discharge gas emanating from the second cyclone;

(k) an anaerobic sludge digester heated by water from the scrubbers, and said digester producing a gaseous fuel for use in the furnace;

(l) means for introducing fresh air into the circulating dryer discharge gas, including means for heating the fresh air in the heat exchanger without contact with furnace discharge gas;

(m) means for introducing combustion air into the furnace.

4,429,644

FLUIDIZED BED FIRING SYSTEM

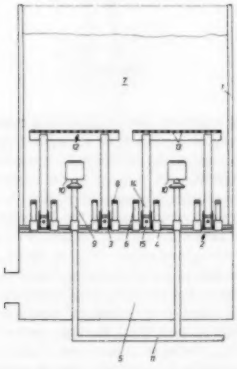
Lothar Thomas, Krefeld, Fed. Rep. of Germany, assignor to Deutsche Babcock Anlagen Aktiengesellschaft, Oberhausen, Fed. Rep. of Germany

Filed Jan. 22, 1982, Ser. No. 341,603

Claims priority, application Fed. Rep. of Germany, Apr. 21, 1981, 3115843

Int. Cl.³ F23G *5/00*

U.S. Cl. 110—245 **11 Claims**



1. Fluidized bed firing system comprising: a combustion chamber having a bottom; coal nozzles penetrating said bottom for introducing a coal/air mixture; air nozzles penetrating said bottom for injecting combustion air into the fluidized bed; a plate having openings and arranged within the fluidized bed in spaced relationship above each coal nozzle, said plates deflecting gas flow for destroying bubbles forming in the bottom of said fluidized bed and continuously enlarging after rising, so that fine particles are prevented from leaving the fluidized bed with the bubbles in unburnt condition and are held substantially long in said fluidized bed, said plate covering only a respective coal nozzle and air nozzle located in close adjacent vicinity, said plates being spaced from each other, the number of plates corresponding to the number of coal nozzles.

4,429,645

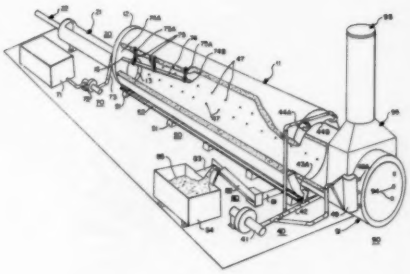
BURNING SYSTEM AND METHOD

R. Edward Burton, 23881 Sherwood Rd., Willits, Calif. 95490

Continuation-in-part of Ser. No. 121,536, Feb. 14, 1980, Pat. No. 4,329,931. This application May 10, 1982, Ser. No. 376,763

Int. Cl.³ F23G *5/12*

U.S. Cl. 110—346 **9 Claims**



1. A substantially smokeless burning system comprising:

an elongated burning chamber having a front, fuel entry end with a fuel entry port located substantially at a lower floor region of said chamber and a rear, combustion gas exit end;

gate means mounted adjacent said fuel entry port and having a closed position blocking said fuel entry port and an open position for admitting fuel through said fuel entry port;

support means for supporting said burning chamber in a generally horizontal orientation;

feeding means for pushing an elongated volume of new fuel into said fuel entry port, thereby pushing already burning fuel generally toward said rear end of said burning chamber to establish a fuel drying zone extending across a lower front portion of said chamber, a volatile burning zone adjacent to and at least partially overlying said fuel drying zone in a generally lower central portion of said chamber, and a charcoal burning zone in a generally lower rear portion of said chamber adjacent to and at least partially overlying said volatile burning zone; and

air delivery means for supplying air to the interior of said chamber at a plurality of locations across at least substantially the total length of said chamber; whereby incomplete combustion products from said volatile burning zone pass through and across said charcoal burning zone and are substantially completely burned in said charcoal burning zone before exiting at said rear end of said burning chamber;

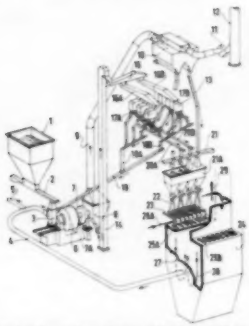
said burning chamber comprising a generally hollow body molded from a refractory material; said feeding means comprising an elongated fuel accumulation chamber communicating with said fuel entry ports and adapted to receive fuel to be burned, a feeding ram carried in said fuel accumulation chamber and adapted to push material therein into said burning chamber, and driving means for driving said feeding ram; and said air delivery means comprising at least one duct integrally formed in an upper wall portion of said hollow body and extending across at least substantially the total length of said body, and a plurality of air delivery ports located at intervals along substantially the total length of said channel to connect said passageway with the interior of said hollow body, said duct being adapted to be connected to an air supply means for deliverying air to the interior of said hollow body through said channel and said air delivery ports.

4,429,646

METHOD AND APPARATUS FOR BURNING DAMP OIL-SHALES OF LOW HEATING POWER

Guy Quesnel, Gif sur Yvette, France, assignor to Societe anonyme dite: Stein Industrie, Velizy-Villacoublay, France

Filed Jun. 17, 1982, Ser. No. 389,350
Claims priority, application France, Dec. 11, 1981, 81 23182
Int. Cl.³ F23D *1/00*
U.S. Cl. 110—347 **11 Claims**



1. A method of burning damp oil-shale of low heating power in a combustion chamber having a chimney, the method comprising:

providing a drying gas by mixing hot gas taken from the combustion chamber with relatively cool gas taken from the chimney, in proportions correlated to the quantity of water in said damp shale;

crushing lumps of said shale in a crusher and in the presence of said drying gas;

injecting the resulting grains of crushed shale together with the hot gas into an expansion chamber in which the major portion of the grains falls out from the drying gas, while the lightest portion of grains is entrained by the gas;

passing the drying gas together with said lightest portion of grains entrained thereby through filter means to separate said lightest portion of grains from the drying gas;

riddling said major portion of the grains to provide a larger grain fraction and a smaller grain fraction;

recycling said larger grain fraction through said crusher;

combining said smaller grain fraction with said lightest portion of grains separated by said filter means; and

injecting the combined grains into said combustion chamber in a suspension in primary air.

4,429,647

METHOD OF AND DEVICE FOR LOOSENING AGRICULTURALLY USED SOIL

Eugen Zinck, Hüffelsheimerstrasse 2, 6550 Bad Kreuznach, Fed. Rep. of Germany

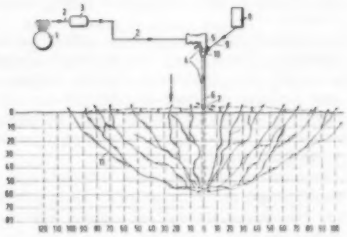
Continuation of Ser. No. 179,164, Aug. 18, 1980, abandoned, which is a continuation of Ser. No. 944,370, Sep. 28, 1978, abandoned. This application Nov. 30, 1982, Ser. No. 445,661
This application Nov. 30, 1982, Ser. No. 445,661
Int. Cl.³ A01C *23/02*
U.S. Cl. 111—6 **5 Claims**

1. A method of pneumatically loosening and breaking open agriculturally used soil from the surface down to a predetermined depth by means of compressed air introduced into the soil, the method comprising the steps of:

(a) storing compressed air under high pressure in a storage container;

(b) injecting said compressed air into the soil at said predetermined depth below the surface of the soil;

(c) controlling said injecting step so that compressed air is released in at least one sudden burst and with sufficient pressure at said predetermined depth to pneumatically lift and erupt the soil, including the said surface, and form air guiding passages extending laterally and upwardly from the injection point to the surface of the soil, with the air escaping at the soil surface through such passages, and



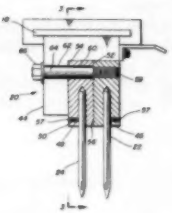
(d) introducing filling materials into said passages immediately following said injecting step to prevent collapsing and closing of said passages.

4,429,648

STAGGERED NEEDLE BAR FOR TUFTING MACHINES

Ian Slattery, Hixson, Tenn., assignor to Spencer Wright Industries, Inc., Chattanooga, Tenn.

Filed Jun. 27, 1983, Ser. No. 508,137
Int. Cl.³ D05C *15/12*
U.S. Cl. 112—79 R **14 Claims**



1. In a tufting machine, needle mounting apparatus for supporting a plurality of needles in two longitudinal rows extending transversely across the machine, the needles in one row being offset longitudinally relative to the needles in the other row to provide a stagger, the amount of offset being adjustable, said apparatus comprising a needle bar housing having a substantially planar reference surface reciprocably carried in said machine, a first elongated needle holding block corresponding to said one row and a second elongated needle holding block corresponding to said other row, said first block having a pair of spaced longitudinally extending substantially planar reference surfaces, said second block having a pair of spaced longitudinally extending surfaces, at least one of said surfaces of said second block being a substantially planar reference surface, means for securing a first plurality of needles intermediate the surfaces of said first block and a second plurality of needles intermediate the surfaces of said second block, fastening means for clamping said blocks to said needle bar housing with the reference surfaces of said first block abutting the respective reference surfaces of said needle bar housing and of said second block and with said first needles offset substantially intermediate said second needles, said fastening means including means for permitting said first block to be positioned relative to said second block and to said needle bar housing for adjusting the stagger of said first needles relative to said second needles so that the first block may be adjusted finely and secured to said needle bar housing and to said second block.

8. A needle bar for supporting a plurality of needles in two longitudinal rows extending transversely across a tufting ma-

chine, the needles in one row being offset longitudinally relative to the needles in the other row to provide a stagger, the amount of offset being adjustable, said needle bar comprising a needle bar housing having a substantially planar reference surface reciprocably carried in said machine, a first elongated needle holding block corresponding to said one row and a second elongated needle holding block corresponding to said row, said first block having a pair of spaced longitudinally extending substantially planar reference surfacea, said second block having a pair of spaced longitudinally extending surfaces, at least one of said surfaces of said second block being a substantially planar reference surface, means for securing a first plurality of needles intermediate the surfaces of said first block and a second plurality of needles intermediate the surfaces of said second block, fastening means for clamping said blocks to said needle bar housing with the reference surfaces of said first block abutting the respective reference surfaces of said needle bar housing and of said second block and with said first needles offset substantially intermediate said second needles, said fastening means including means for permitting said first block to be positioned relative to said second block and to said needle bar housing for adjusting the stagger of said first needles relative to said second needles so that the first block may be adjusted finely and secured to said needle bar housing and to said second block.

4,429,649

ASSEMBLY FOR LOWER THREAD TENSION ADJUSTMENT OF SEWING MACHINE

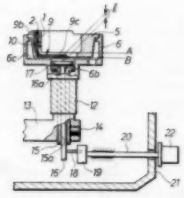
Yasukata Eguchi, Kunitachi, and Eiichi Shomura, Hachioji, both of Japan, assignors to Janome Sewing Machine Industry Co., Ltd., Japan

Filed Sep. 25, 1981, Ser. No. 305,802

Claims priority, application Japan, Sep. 26, 1980, 55-136050[U]

Int. Cl.³ D05B *63/00*

U.S. Cl. 112—229 **5 Claims**



1. An assembly for adjusting a lower thread tension for use in combination with a sewing machine having a loop taker and a bobbin carrier which is held by the loop taker and carries therein a bobbin loaded with a lower thread, said assembly comprising

(a) a base plate attached to an inner wall of the bobbin carrier and provided with a slit through which the lower thread passes;

(b) a substantially L-shaped presser element having a vertical portion and a horizontal portion, the vertical portion being adapted to be normally pressed against the base plate so as to give a tension to the lower thread passing through the slit;

(c) means for turnably supporting the L-shaped presser element with respect to the base plate;

(d) magnetic means acting on the horizontal portion of the L-shaped presser element without contact thereto for turning the L-shaped presser element; and

(e) means for manually operating the magnetic means to vary a magnetic force of the magnetic means with respect to the horizontal portion of the L-shaped presser element.

4,429,650

EXTRUDED SEWING MACHINE FRAME

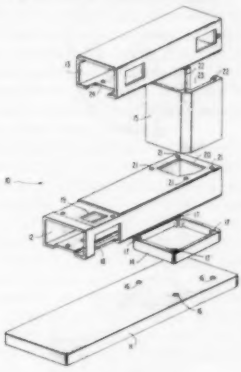
Hitoshi Ishikawa, Nishio; Kimihiko Yamamoto, Nagoya, and Yasuro Sugiura, Takahama, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Aichi, Japan

Filed Dec. 30, 1981, Ser. No. 335,494

Claims priority, application Japan, Jan. 14, 1981, 56-003667

Int. Cl.³ D05B *73/00*

U.S. Cl. 112—258 **4 Claims**



1. A sewing machine frame composed of a plurality of hollow extruded components comprising a vertical support member comprised of hollow extrusion means, a horizontal cantilevered bed comprised of hollow extrusion means connected to said support member, a horizontally disposed arm comprised of hollow extrusion means connected to said support member in spaced parallel relation to said bed and a base member connected to said support member.

4,429,651

DEVICE FOR DETECTING ABSENCE OF A THREAD IN A SEWING MACHINE

Ikuo Tajima, Nagoya, Japan, assignor to Tokai Kogyo Mishin Kabushiki Kaisha, Kasugai, Japan

Filed Jul. 29, 1980, Ser. No. 173,425

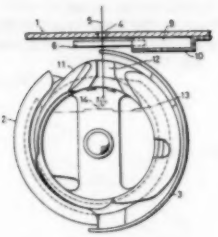
Claims priority, application Japan, Aug. 6, 1979, 54-100578; Aug. 6, 1979, 54-100579; Jun. 27, 1980, 55-88443

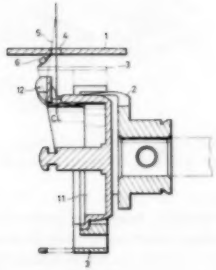
Int. Cl.³ D05B *69/36*

U.S. Cl. 112—273 **7 Claims**

1. A device for detecting absence of a needle thread or a bobbin thread in a sewing machine having a throat plate including a needle hole provided therein, a rotary hook and a rotary hook fin fitted on said rotary hook, said device comprising at least one piezoelectric element provided between said throat plate and said rotary hook and adapted for intermittent

contact with one of said threads when said thread shifts from the center of said needle hole by engaging with said rotary hook fin, said thread passing vertically through said center of said needle hole.



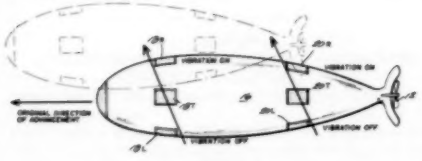


4,429,652

ULTRASONIC EXCITATION OF UNDERWATER TORPEDOES FOR ENHANCING MANEUVERABILITY, SPEED AND TARGETING ACCURACY

Israel Stol, Monroeville, Pa., assignor to Invocas, Inc., Columbus, Ohio

Filed Nov. 23, 1981, Ser. No. 324,010
Int. Cl.³ F42B *19/01*
U.S. Cl. 114—20 R **13 Claims**



13. A method for steering an underwater hull such as that of a torpedo having an external wall defining a longitudinally forward-presented nose portion and a laterally-presented portion, where the external wall has an external surface which is subject to skin friction drag due to the generation and existence on and adjacent to said external surface of a boundary layer of fluid as the hull is advanced through the water, said hull including a propulsion device for advancing the hull through the water at such a speed that a substantial-portion of such energy as is expended in operating said propulsion device would need to be expended for overcoming said skin friction drag, and for permitting the hull to be advanced through the water by said propulsion device at a substantially reduced expenditure of propulsive energy, due to ultrasonically-induced high-energy continuing fragmentation of the fluid boundary layer adjoining said external surface of said external wall of said hull,

said method comprising:

(a) providing said external wall at at least three respective sites thereof with respective ultrasonically-vibratable plates each having an external face which is generally flush with said external surface of said external wall of said hull, at least one of these plates being directed substantially axially forwardly from said nose portion and at least two others of these plates being directed laterally outwards from said laterally-presented portion, said sites of these two plates being angularly spaced part-way around said hull from one another; and

(b) controllingly supplying ultrasonic vibrational power to each of said plates from within said hull for at least sometime vibrating ones of the respective plates sufficiently to produce ultrasonically-induced fragmentation of said fluid boundary layer adjoining said external surface of said external wall of said hull in the vicinity of the respective said plates, whereby said hull may be more easily advanced through the water in a direction toward where said fluid boundary layer is being fragmented, including

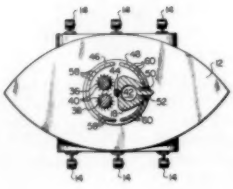
(c) while propelling said hull through the water along a path of movement underwater using said propulsion device, altering said path of movement, midcourse, by at least temporarily providing less power to at least one of said laterally outwardly directed plates than to at least another of said laterally outwardly directed plates.

4,429,653

MEANS EMPLOYING HYDRO-JETS FOR FACILITATING THE CLEARING OF DISAGGREGATED ICE CHUNKS FROM THE CUTTING REGION

George W. Morgan, San Jose, Calif., and Vernon F. Wetzel, Calgary, Canada, assignors to Suncor, Inc., Toronto, Canada

Continuation of Ser. No. 140,041, Apr. 14, 1980, abandoned.
This application Feb. 1, 1982, Ser. No. 344,447
Int. Cl.³ B63B *35/12*
U.S. Cl. 114—42 **3 Claims**



1. A semi-submersible operations vessel adapted for use in ice covered waters, said vessel including a subsurface flotation hull, an above-water deck structure, and an intermediate hull up-standing between said flotation hull and said deck structure, said intermediate hull including cooperating ice engaging, disaggregation, and clearing means comprising:

(A) a counter-rotating pair of vertically oriented, ice disaggregating drums;

(B) a nautrical wedge portion having a roughly triangular cross-section with a first side thereof being disposed proximate peripheries of said drums;

(C) pressurized hydro-jet means adapted to deflect disaggregated ice chunks, which ice chunks tend to follow natural flow paths proximate said drum peripheries, from said natural flow paths into preferred discharge paths, said pressurized hydrojet means comprising first and second vertical arrays of nozzles generally centrally disposed on said first wedge side and further disposed generally equidistant from the axes of said drum pair, said first and second nozzle arrays being directed, respectively, outwardly between said first wedge side and the periphery of a first drum of said drum pair and outwardly between said

first wedge side and the periphery of a second drum of said drum pair, such that disaggregated ice tends to follow discharge paths proximate second and third sides of said nautical wedge, thereby preventing horizontal packup of disaggregated ice chunks in the region of said drums; and

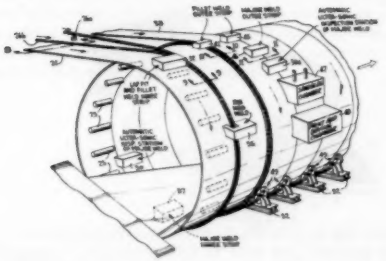
(D) air release means disposed proximate the lower end of said intermediate hull for controllably mixing air with seawater to provide a support fluid, for ice chunks disaggregated by said drum pair, which has a lower density than seawater alone, thereby controllably slowing the ascent rate of such ice chunks to inhibit vertical packup thereof.

4,429,654

HELICAL SEAM STRUCTURAL VESSEL, METHOD AND APPARATUS OF FORMING SAME

Richard H. Smith, Sr., 2926 Sing Sing Rd., R.D. #1, Elmira, N.Y. 14903

Filed Jul. 10, 1981, Ser. No. 282,082
Int. Cl.³ B63B *9/06, 3/00*; F16L *9/16, 9/18*
U.S. Cl. 114—65 R **12 Claims**



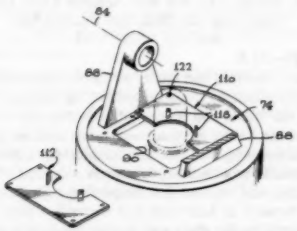
1. A structural vessel, comprising an inner tubular liner and an outer tubular shell surrounding said liner in spaced relation, said liner and said shell comprising helically curved strips of material, continuous and helically curved spacer means between said liner and said shell, said spacer means spanning contiguous edges at successive turns of said liner and spanning contiguous edges at successive turns of said shell, and means seaming together said liner edges and seaming together said shell edges, said spacer means being secured to said strips via said seaming means.

4,429,655

SINGLE LEG TERMINAL

Phillip H. Tang, Rosemead, Calif., assignor to Amtel, Inc., Providence, R.I.

Continuation-in-part of Ser. No. 34,555, Apr. 30, 1979, Pat. No. 4,326,312. This application Jan. 21, 1982, Ser. No. 341,312
Int. Cl.³ B63B *21/52*
U.S. Cl. 114—230 **8 Claims**



1. In a single leg mooring installation which includes a riser assembly extending up from the sea floor to near the sea surface to moor to a vessel, and a fluid conduit which can extend upwardly from the sea floor and sidewardly from an underwater location to the vessel to transfer a fluid cargo between a pipe near the sea floor and the vessel, and wherein the upper portion of the riser assembly must be tiltable and the upper portions of both the riser assembly and fluid conduit must be capable of rotating without limit about a substantially vertical axis to follow a drifting vessel, the improvement wherein:

said riser assembly includes a nonrotatable base lying at the sea floor, a turntable rotatably mounted on the base to rotate about a vertical axis thereon and having a hole at said axis, and a yoke-like member having a pair of upstanding leg portions with lower ends mounted on radially outer portions of said turntable to leave the middle of the turntable free of obstruction, said yoke-like member having an upper portion pivotably connected to the lower portion of said riser assembly;

said fluid conduit includes a fluid swivel lying under said turntable and having a rotatable portion rotatable about said vertical axis, and also includes a pipe transition element extending through said hole in said turntable and having a lower end coupled to said rotatable portion of said fluid swivel and an upper end lying above said turntable and extending at an angle to said vertical axis; and

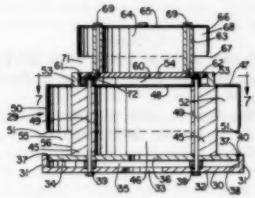
means for sealing said pipe element to said turntable to resist the entry of silt into the area under said turntable occupied by said fluid swivel, said means including at least one member having a radially outer portion directly mounted on an area of said turntable that surrounds said hole and an inner portion sealed to said pipe.

4,429,656

TOROIDAL SHAPED CLOSED CHAMBER WHISTLE

Richard J. Weisenberger, 8 Kentoboo Dr., Erlanger, Ky. 41018

Filed Feb. 1, 1982, Ser. No. 344,364
Int. Cl.³ B06B *1/18*
U.S. Cl. 116—137 R **27 Claims**



1. A single-tone toroidal whistle for producing a directional output comprising:

(a) a hollow cylinder having a closed continuous bottom end and having an open top end;

(b) the bottom end of said cylinder having a central aperture for the passage of air under pressure into the hollow portion of said hollow cylinder;

(c) a circular plate positioned within said hollow cylinder parallel to the bottom end of said hollow cylinder to form an air passage between said circular plate and the bottom end of said hollow cylinder, said circular plate positioned within said hollow cylinder to form an annular air slit between said circular plate and the inner wall of said hollow cylinder;

(d) a torus positioned on top of said circular plate, said torus having an interior cavity;

(e) a circular cover affixed to the top of said torus;

(f) a lip descending perpendicularly from said circular cover, said lip being tapered to form a point on said lip above said inner wall of said hollow cylinder;

(g) said torus, said lip, and said circular cover together forming between them a chamber, air under pressure from

said annular air slit being adapted to pass to form a sound wave within said chamber, said chamber having a width in a 1 to 3 ratio to the length of said chamber, the outer diameter of said chamber being about 0.625 times the fundamental wavelength of said sound wave.

4,429,657

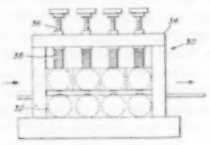
METHOD, MATERIALS AND APPARATUS FOR MANUFACTURING PRINTED CIRCUITS

Raymond C. DesMarais, Jr., North Chelmsford, Mass., assignor to Additive Technology Corporation, North Chelmsford, Mass.

Division of Ser. No. 103,157, Dec. 13, 1979, Pat. No. 4,327,124. This application Apr. 26, 1982, Ser. No. 372,095

Int. Cl.³ B05C *11/02*

U.S. Cl. 118—114 **1 Claim**



1. Apparatus for use in making printed circuit boards having at least a stratum of conductive ink and a stratum of conductive particles thereon comprising:

(a) a frame;

(b) a plurality of pairs of rollers mounted to said frame; and,

(c) means for driving a least one of each pair of rollers;

(d) said rollers mounted to define a linear path between each pair for a board fed therethrough;

(e) said rollers defining progressively increasing durometer hardness along said linearpath.

4,429,658

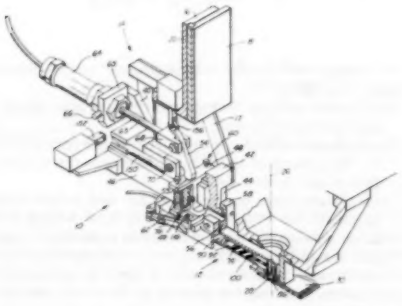
SEALANT APPLICATOR FOR RIVETS

Everett E. Jones, Wichita, Kans., assignor to The Boeing Company, Seattle, Wash.

Filed Aug. 10, 1981, Ser. No. 291,400

Int. Cl.³ B05C *7/00*

U.S. Cl. 118—711 **8 Claims**



1. A sealant applicator for rivets, the applicator used for applying a sealant to a rivet hole immediately after a rivet hole is drilled in a work piece and prior to installing the rivet, the applicator comprising:

an air operated probe assembly having a probe mounted therein for moving adjacent to the circumference of the top of the rivet hole of the work piece and leaving a thin film of sealant thereon and between the probe and the circumference when the assembly engages the top of the work piece; and

means for moving the probe assembly for a retracted position with the center line of the probe displaced from the center line of the rivet hole to a position where the center line of the probe is indexed with the center line of the rivet hole, lowering the assembly to engage the top of the work piece and returning the assembly to the retracted position when the sealant has been dispensed by the probe.

4,429,659

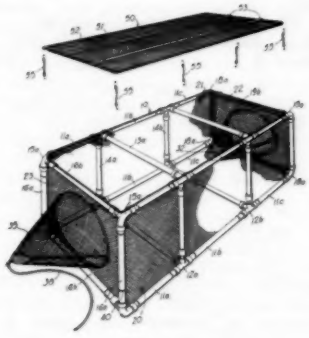
APPARATUS AND METHOD OF CONFINING FISH

Hugh K. Holyoak, Rte. 1, Alapaha, Ga.

Filed Apr. 10, 1981, Ser. No. 252,934

Int. Cl.³ A01K *63/00*

U.S. Cl. 119—3 **24 Claims**



1. Apparatus for confining fish comprising:

(a) a bouyant rigid frame defining an essentially open interior, said frame being formed of struts and means joining the ends of such struts, said means and said struts providing a perimeter defining an upper opening;

(b) a net assembly having flexible side walls and a flexible bottom joining the lower ends of said side walls, the upper edge portions of said side walls extending over and being secured to said frame for defining within said upper opening, an upwardly opening access opening;

(c) top means forming a removeable top extending over said access opening, said top means being supported by said frame for temporarily closing of said access opening; and

(d) detent means removeably for securing said top in its position extending over said access opening.

4,429,660

WATER POWERED FISH FEEDER

Edward F. Olson, 1961 Merritt, Turlock, Calif. 95380, and Robert F. Olson, P.O. Box 847, Summer Lake, Oreg. 97640

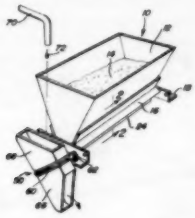
Filed Aug. 25, 1982, Ser. No. 411,862

Int. Cl.³ A01K *5/00*

U.S. Cl. 119—51 R **10 Claims**

1. A water powered fish feeder assembly comprising a frame having a longitudinal opening extending along an interior portion of the frame and having at ends thereof a supporting base, a feed bin havng a passageway communicating with the longitudinal opening, the feed bin adapted for containing and storing granular-type fish feed, a shaft mounted for rotation supported by bushings on the supporting base and the shaft extending beyond at least one end thereof, a metering rotor fixedly secured to the shaft and having its diametrical dimension essentially filling a transverse sectional area of the passageway whereby rotation of the shaft in one direction is effective to cause the rotor to dispense a predetermined amount of feed from the feed bin, means mounting at least one

container fixedly and eccentrically on the shaft for water collection in the container until a water level is reached whereupon exceeding the water level, the container is tipped about the shaft axis for emptying the container while rotating the shaft and rotor in said one direction through a predetermined



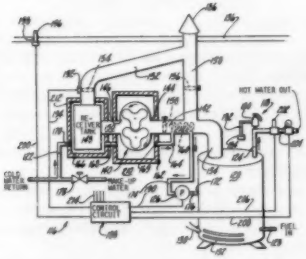
rotational increment to dispense said amount of feed, and means to thereafter return the container to its original position accompanied by rotation of the shaft and rotor in the opposite direction, whereupon water is again collected in said at least one water container for repeating the dispensing of said amount of fish feed from the assembly.

4,429,661

HEAT RECOVERY APPARATUS AND METHOD

Michael C. McClure, 2808-17 Mile Rd., Sterling Heights, Mich. 48078

Filed Nov. 27, 1981, Ser. No. 325,532
Int. Cl.³ F22B *33/00*
U.S. Cl. 122—20 B **25 Claims**



1. A flue gas heat recovery apparatus for use within a heating plant including an exhaust flue and a cold fluid return duct, said apparatus comprising:

compressor means operative to draw relatively low temperature exhaust gases within said flue at a relatively low inlet pressure and to discharge said gases at an elevated outlet pressure;

a heat exchanger disposed within said return duct and operative to receive said discharged gases to effect a transfer of thermal energy from said gases to fluid flowing within said return duct;

means operative to selectively vary operation of said compressor as a function of predetermined operating parameters; and

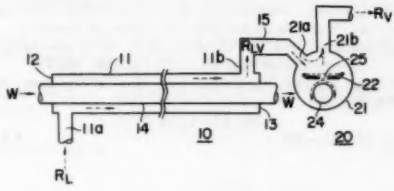
means operative to effect exhaust of gases existing said heat exchanger to a low pressure sink.

4,429,662

METHOD AND APPARATUS FOR GENERATING VAPOR

Kenichi Hashizume, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kanagawa, Japan

Continuation of Ser. No. 159,491, Jun. 16, 1980, abandoned. This application Jul. 13, 1982, Ser. No. 397,790
Claims priority, application Japan, Jun. 21, 1979, 54-77503; Jul. 24, 1979, 54-93303
Int. Cl.³ F22B *1/02*
U.S. Cl. 122—32 **10 Claims**



1. A method of generating vapor comprising the steps of:

preparing a first evaporator in which a liquid is evaporated by a heating fluid having a higher temperature than an evaporating temperature of said liquid to form a mixture of said liquid and vapor thereof and a second evaporator including a heat transfer tube for evaporating said liquid of said mixture;

simultaneously passing said liquid and said heating fluid through said first evaporator in a heat transfer relationship thus forming said mixture of said liquid and vapor thereof, said mixture having a vapor-water ratio of from 0.6 to 0.8;

admitting said mixture into said second evaporator to separate said vapor from said liquid;

passing said separated liquid about said heat transfer tube to substantially completely evaporate said separated liquid; and

supplying the vapor in said second evaporator to vapor utilization apparatus.

5. Apparatus for generating vapor from a liquid comprising:

a first heat exchanger having at least one first heat transfer tube and a first heat transfer jacket, said first heat transfer tube passing through said first heat transfer jacket, whereby a fluid passing through said first heat transfer tube can transfer its heat to a liquid passing through said first heat transfer jacket, said liquid being at a lower temperature than said fluid, to at least partially evaporate said liquid;

means for supplying a heated fluid to said first heat transfer tube;

means for supplying a liquid to said first heat transfer jacket;

a second heat exchanger having at least one second heat transfer tube and a second heat transfer jacket, said second heat transfer tube passing through said second heat transfer jacket;

means for supplying a heated fluid to said second heat transfer tube;

means connecting said first heat transfer jacket to said second heat transfer jacket, whereby the vapor and liquid portions of said partially evaporated liquid of said first heat transfer jacket flows into said second heat transfer jacket;

said second heat exchanger further comprising a vapor exit vent on said second transfer jacket, the vapor portion of said partially evaporated liquid from said first heat exchanger jacket flowing into said second heat exchanger jacket immediately passing out from said second heat exchanger jacket through said vent; and

a distributor plate disposed over said second heat transfer tube, said plate being adapted to receive the liquid portion

of said partially evaporated liquid from said first heat exchanger jacket flowing into said second heat exchanger jacket, said plate having openings so formed so as to permit said liquid portion to be distributed over said second heat transfer tube in a thin film, whereby said liquid portion is evaporated, the vapor from said evaporated liquid portion passing out from said second heat exchanger jacket through said vent.

4,429,663

REACTOR PRESSURE VESSEL FOR A BOILING-WATER REACTOR

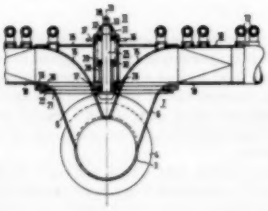
Heinrich Dorner, and Günter Rabe, both of Erlangen, Fed. Rep. of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mulheim an der Ruhr, Fed. Rep. of Germany

Continuation of Ser. No. 52,629, Jun. 27, 1979, abandoned. This application May 15, 1981, Ser. No. 264,139

Claims priority, application Fed. Rep. of Germany, Jul. 5, 1978, 2829590

Int. Cl.³ F22B *37/22*

U.S. Cl. 122—365 **8 Claims**



1. In a reactor pressure vessel for a boiling-water reactor having a feedwater inlet nozzle, the combination comprising a heat protective pipe received in the nozzle and having an extension projecting therefrom, a feedwater sparger ring disposed in a given plane inside the vessel and having additional nozzles disposed thereon for distributing feedwater inside the vessel, and means for connecting said feedwater sparger ring to said heat protective pipe, said connecting means comprising an elbow extending angularly downward from said given plane and connecting said feedwater sparger ring to said extension of said heat protective pipe, another extension projecting from said heat protective pipe, and said connecting means also comprising another elbow extending angularly from said given plane and extending said feedwater sparger ring to said other extension of said heat protective pipe defining two portions of said sparger ring being disposed between said connections, said portions both being open between said connections, said extensions and said elbows being, respectively, disposed symmetrically to one another with respect to a common plane of symmetry being perpendicular to the axis of said heat protective pipe and including a locking device disposed in said plane of symmetry and locking said extensions and said elbows together.

4,429,664

COOLED SHAKING GRATE HAVING NO GRATE BAR

Karl Feldhoff, Marienheide, and Paul Peters, Gummersbach, both of Fed. Rep. of Germany, assignors to L. & C. Steinmüller GmbH, Gummersbach, Fed. Rep. of Germany

Filed Dec. 3, 1982, Ser. No. 446,710

Claims priority, application Fed. Rep. of Germany, Dec. 8, 1981, 3148446

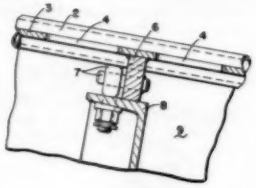
Int. Cl.³ F22B *31/00;* **F23K** *3/08*

U.S. Cl. 122—376 **1 Claim**

1. A shaking grate for a fuel bed, said shaking grate having an inlet with a charging region for said fuel bed and including:

a vibrating grate carriage which is provided with crossbars;

a planar grate sheet comprising alternatingly, inclined and interconnected tubes and crosspieces; said tubes being continuous and being disposed parallel to the direction of incline; said crosspieces having slot-shaped openings which taper conically in the direction of said fuel bed, said crosspieces being free of said openings in the region of said inlet for said fuel bed and up to the beginning of the first combustion zone of said fuel bed;



ridge plates and heat-compensating glide elements for connecting said grate sheet to said crossbars of said grate carriage;

a coolant circuit with which said tubes communicate; and

a riser for coolant, said riser being situated in said charging region of said inlet for said fuel bed.

4,429,665

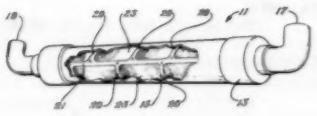
FUEL TREATING DEVICE AND METHOD

Bill H. Brown, 3933 Boise Ct., Irving, Tex. 75062

Filed Aug. 17, 1982, Ser. No. 408,756

Int. Cl.³ F02M *27/00*

U.S. Cl. 123—3 **8 Claims**



1. A fuel treating device for improving the combustion characteristics of liquid fuels comprising:

a casing through which liquid fuel is adapted to flow;

an elongated metal bar located inside said casing for contacting said fuel flow;

said metal bar comprising an alloy of nickel, zinc, copper, tin, and silver.

7. In a combustion process wherein liquid fuel and an oxygen-containing gas are first mixed and then ignited, a method of treating the fuel prior to mixing it with the gas, comprising the steps of:

flowing said fuel through a casing having a hollow interior in which is housed an elongated metal bar, said bar having exterior surfaces in contact with said fuel flow;

wherein said metal bar is an alloy of nickel, zinc, copper, tin, and silver.

4,429,666

MOTOR VEHICLE HAVING AN INTERNAL-COMBUSTION ENGINE FITTED WITH MEANS FOR CONTROLLING THE AIR STREAM FLOWING THROUGH THE ENGINE COMPARTMENT

Filippo Surace, and Giampaolo Garcea, both of Milan, Italy, assignors to Alfa Romeo Auto S.p.A., Naples, Italy

Filed Apr. 1, 1982, Ser. No. 364,314

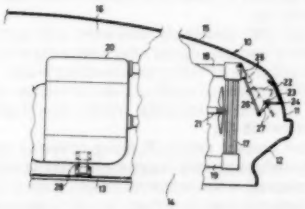
Claims priority, application Italy, Apr. 6, 1981, 20950 A/81

Int. Cl.³ F01P *11/10*

U.S. Cl. 123—41.05 **1 Claim**

1. A motor vehicle front body portion defining an engine

compartment, said engine compartment including a front portion and a rear portion, an engine mounted in said rear portion and an air cooled radiator for said engine mounted in said front portion, said front body portion being in the form of a shell and having a rounded front part extending above and below said radiator, said front body portion being open at the bottom thereof between said radiator and said grill for the discharge of air, and said rounded body front part having air flow means for the flow of cooling air through said rounded body front part to and through said radiator, said air flow means including constantly open air ports for directing normally required cooling air to said radiator, and an additional air port formed in said



rounded body front part above said normally open air ports and in horizontal alignment with said radiator, said additional air port generally lying in a primarily vertical plane, a closure slat normally aligned with said additional air port and generally forming a part of the contour of said rounded body front part, mounting means pivotally mounting said closure slat for pivoting from its body contour forming position closing said additional air port to a generally horizontal out of the way position, and a thermostatically activated device carried by said radiator and coupled to said mounting means to selectively position said closure slat in accordance with the temperature of engine coolant.

4,429,667

FUEL SUPPLY FOR A MULTI-CYLINDER INTERNAL COMBUSTION ENGINE

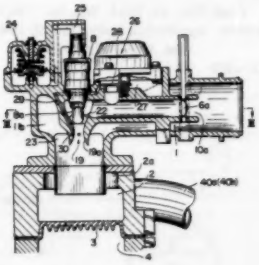
Yoshihisa Kawamura, Fujisawa, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Division of Ser. No. 89,266, Oct. 29, 1979, Pat. No. 4,378,761. This application Oct. 26, 1981, Ser. No. 315,146

Claims priority, application Japan, Nov. 1, 1978, 53-135031

Int. Cl.³ F02M *61/14*

U.S. Cl. 123—52 M **5 Claims**



1. A method for supplying a fuel to a single point fuel injected internal combustion engine comprising:

producing a primary air flow in an air intake manifold;

injecting fuel directly into the primary air flow in a direction substantially parallel to said primary air flow at the point of injection for atomization therein;

producing an auxiliary air flow substantially parallel to said primary air flow around said primary air flow in the vicinity where the fuel injection is effected;

guiding said primary air flow and injected fuel by said auxiliary air flow towards a riser portion of said air intake manifold for evaporating the injected fuel and for creating a uniform air/fuel mixture, said riser portion having a floor surface in contact with an exhaust passage; and

adjusting the auxiliary air flow corresponding to the load condition on the engine for increasing said auxiliary air flow under substantially high load condition.

4,429,668

INTERNAL COMBUSTION ENGINE FOR PORTABLE MACHINE

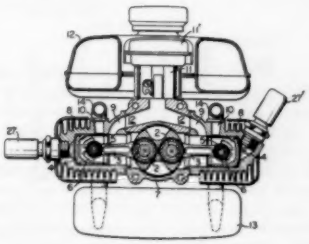
Kumaichi Nakagawa, Kokubunji, and Hisashi Inaga, Tokyo, both of Japan, assignors to Kioritz Corporation, Tokyo, Japan

Filed Sep. 15, 1982, Ser. No. 418,155

Claims priority, application Japan, Oct. 20, 1981, 56-156204[U]

Int. Cl.³ F02B *75/24*

U.S. Cl. 123—56 B **1 Claim**



1. A 2-cycle opposed cylinder simultaneous ignition type internal combustion engine comprising: a crank case **7**; an intake system provided at the upper side of said crank case **7** and including a carburetor **11**, air cleaner **11'** and so forth; a fuel tank **12** arranged around said intake system; a manifold type exhaust muffler **13** provided at the lower side of said crank case **7**; a starter **18** provided on one end of said crank case **7** in the axial direction of a crank shaft **1** of the engine; a transmission shaft **22** for working machine detachably connected to the output side of said crank shaft **1**; and internally cooled type pistons **4,4** received by two cylinders **8,8** acting as piston valves; each of said cylinders **8,8** having an intake port **9** and an exhaust port **10** which are arranged on the same side of said cylinder **8** in a side-by-side relation in the direction of axis of said cylinder **8**.

4,429,669

VALVED PRECHAMBER DIESEL ENGINE AND METHOD OF OPERATING

Harvey A. Burley, Rochester, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 8, 1982, Ser. No. 346,868

Int. Cl.³ F02B *19/02, 75/02*

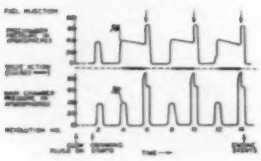
U.S. Cl. 123—179 H **3 Claims**

1. The method of operating for starting and warming up a low compression indirect injection compression ignition internal combustion engine having a variable volume main combustion chamber connected by a throat to a prechamber into which fuel is injected for burning to develop power and having a valve operative to close or open the throat to permit or prevent communication between the prechamber and the main combustion chamber, wherein said chambers each form at least one quarter of the total cylinder clearance volume, said method comprising the steps of

admitting a charge of air to the main combustion chamber and subsequently contracting the main combustion chamber to compress the fresh charge into the clearance volume comprising the main combustion chamber and the prechamber,

closing the valve to retain in the prechamber the portion of the charge compressed therein,

maintaining the valve closed while expanding and discharging the remaining charge portion in the main combustion chamber, admitting a second fresh charge and at least beginning its compression in the main combustion chamber,



fully compressing the second fresh charge and opening the valve to combine the compressed second fresh charge in the main combustion chamber with the retained compressed charge in the prechamber to provide an increased pressure in the prechamber sufficient for compression ignition,

injecting a charge of fuel into the prechamber for ignition and burning, expanding the main combustion chamber to develop power, exhausting the burned gases, and

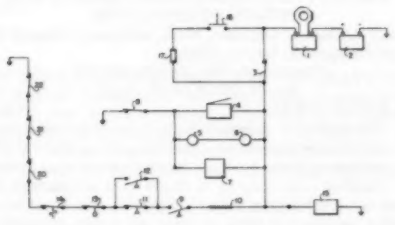
repeating the foregoing steps for a sufficient number of cycles to allow normal running of the engine with compression ignition in the prechamber at the established low engine compression ratio.

4,429,670

ENGINE PROTECTION SYSTEMS

George D. Ulanet, 89 Claremont Ave., Maplewood, N.J. 07040

Filed Feb. 3, 1978, Ser. No. 875,100
Int. Cl.³ F02B *77/08*
U.S. Cl. 123—198 D **15 Claims**



1. An internal combustion engine protection system having monitoring means for monitoring one or more operating parameters of the engine, alarm means and disabling means coupled to said monitoring means for indicating when at least one operative condition does not fall within predetermined safe parameters and for disabling the engine if the condition endures for a predetermined period of time, and override means for overriding said disabling means and re-enabling operation of the engine, the improvement comprising, comprehensive circuitry for said monitoring, alarm and disabling means, said circuitry comprising:

a normally open low RPM oil pressure sensor switch (**9**) that is adapted to close at a predetermined low oil pressure build up;

a normally open high RPM oil pressure sensor switch (**12**) that is adapted to close at a predetermined high oil pressure build up;

a relay coil (**10**) operatively associated with said switches and with a normally closed relay switch (**8**) in the portion of said circuitry including said disabling means;

said disabling means comprising a shut-down circuit breaker means (**7**) and a normally closed shut-down circuit breaker switch (**3**);

said circuit breaker means (**7**) being activated by current flow therethrough under engine operating conditions and being adapted, when subjected to said current flow for a predetermined period of time, to effect opening of said circuit breaker switch (**3**) to thereby disable engine operation;

each of said pressure sensor switches (**9, 12**) when closed completing an electric circuit to thereby energize the relay coil (**10**);

whereby the energized relay coil (**10**) effects opening of said relay switch (**8**) to thereby interrupt said current flow to the shut-down circuit breaker means (**7**) to forestall said engine disablement due to opening of the shut-down circuit breaker switch **3**; and

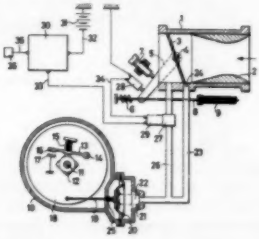
said pressure sensor switches (**9, 12**) being each adapted to open, when the associated oil pressure does not fall within the safe operating parameter, to thereby effect deenergizing of the relay coil (**10**) with the consequent closing of the relay switch (**8**) to thereby initiate reactivation of the shut-down circuit breaker means (**7**) by current flow therethrough.

4,429,671

DEVICE FOR AUTOMATICALLY ADJUSTING THE ROTATIONAL SPEED OF AN INTERNAL COMBUSTION ENGINE WHEN OPERATING UNDER IDLING CONDITIONS

Filippo Surace, Milan, Italy, assignor to Alfa Romeo S.p.A., Milan, Italy

Filed Dec. 31, 1981, Ser. No. 336,273
Claims priority, application Italy, Jan. 9, 1981, 19068 A/81
Int. Cl.³ F02P *5/04*
U.S. Cl. 123—339 **4 Claims**



1. A device for automatically adjusting a spark advance of an ignition system for controlling the idling r.p.m. of an internal combustion engine, said device being of a type controlled by a first sensor means of a pneumatic kind comprising a sealed

cavity, a membrane in said cavity, and elastic means acting on said membrane, switch means adapted to control said ignition system, said membrane being operatively connected to said switch means, said cavity being connected by a first conduit to an intake manifold for air aspirated by the engine upstream of a throttle valve positioned in said intake manifold and being connected by a second conduit to the said intake manifold downstream of said throttle valve, said second conduit being controlled by an electrically operated valve controlled by second sensor means which senses engine speed and by third sensor means which senses the position of said throttle valve.

4,429,672

DEVICE FOR CONTROLLING THE RATE OF DELIVERY OF A FUEL-INJECTION FOR AN INTERNAL-COMBUSTION ENGINE

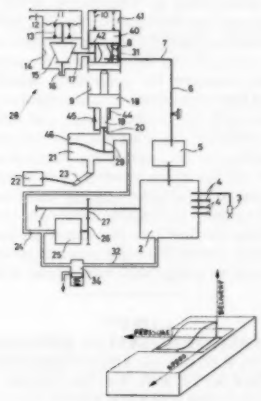
Manuel Roca-Nierga, Barcelona, Spain, assignor to Spica S.p.A., Leghorn, Italy

Filed Apr. 14, 1982, Ser. No. 368,118

Claims priority, application Fed. Rep. of Germany, Apr. 18, 1981, 3115720

Int. Cl.³ F02D *1/06*

U.S. Cl. 123—369 **18 Claims**



1. A controlled device for an internal combustion engine comprising pump means for generating fuel pressure which is proportional to the rpm's of an internal combustion engine, means for delivering fuel to injectors of an internal combustion chamber, means for developing supercharging pressure for an internal combustion engine, means for controlling said fuel delivering means in response to fuel pressure and supercharging pressure, said controlling means including a tridimensional planar cam, means for mounting said cam for sliding movement in two directions perpendicular to each other in a common plane, means for moving said cam in a first of said two directions in response to the generated fuel pressure, first means for biasing said cam in a direction opposite to said first direction against the force of the generated fuel pressure, means for moving said cam in a second of said two directions in response to the supercharging pressure, second means for biasing said cam in a direction opposite to said second direction, and means for responding to cam movement in both of said two directions for operating said fuel delivering means.

4,429,673

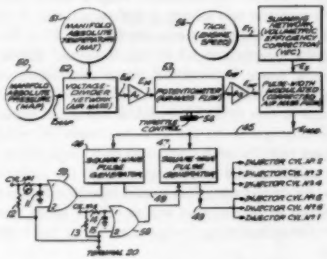
PROGRAMMED COLD START ENRICHMENT CIRCUIT FOR A FUEL INJECTED INTERNAL COMBUSTION ENGINE

Richard E. Staerzl, Fond du Lac, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Filed Dec. 11, 1981, Ser. No. 329,990

Int. Cl.³ F02B *3/00*

U.S. Cl. 123—491 **11 Claims**



1. Electronic pulse generating means for timing the solenoid-excitation of a fuel-injection solenoid valve in a throttle controlled internal combustion engine, comprising, means responsive to incoming trigger signals generated by engine cylinder firing for normally enabling said pulse generating means at a first predetermined frequency of pulse generation, means responsive to a continuously evaluated plurality of electrically sensed parameters for varying the pulse width generated by said pulse generating means under conditions of normal engine operation, means responsive to engine starting under cold operating conditions for enabling said varying means to increase said pulse width and means responsive to engine starting and engine throttle position for enabling said pulse generating means at a second predetermined frequency of pulse generation.

4,429,674

MULTICYLINDER INTERNAL COMBUSTION ENGINE

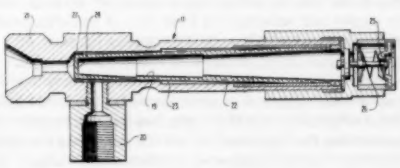
Bernd-Eric Lübbing, Winterbach, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 46,493, Jun. 7, 1979, abandoned. This application Nov. 20, 1981, Ser. No. 323,483

Claims priority, application Fed. Rep. of Germany, Jun. 14, 1978, 2826025

Int. Cl.³ F02B *3/00*

U.S. Cl. 123—531 **1 Claim**



1. A fuel supply arrangement for an internal combustion engine, the fuel supply arrangement including

an injection means for supplying a premixed fuel-gas mixture so that the fuel is in the form of a mist with droplets of a substantially identical droplet size each having a diameter at which a flow characteristic is obtained which is the same as a flow characteristic of the gas of the fuel-gas mixture,

the injection means includes a discharge orifice, and is con-

structed so that the fuel-gas mixture is discharged from the discharge orifice substantially at the speed of sound, and in that

the injection means includes an injection nozzle, a fuel-gas mixing chamber means comprising a longitudinal bore hole in the injection nozzle,

a valve means for selectively opening and closing the discharge orifice in dependence upon a pressure in the mixing chamber means,

an approximately cylindrically shaped insert means, of porous material and having a hollow interior, is arranged in the mixing chamber means for filtering all of the air reaching the nozzle and all of the fuel, and disposed with a hollow space between its outer circumference and the wall of the longitudinal bore hole, and comprising closure means at one cylindrical end of the insert means,

means contiguous to the closure means to seal the insert means radially with respect to said longitudinal bore hole for isolating said hollow space from the closure means,

means for introducing fuel to said injection means toward an exterior of said closure means of said insert means,

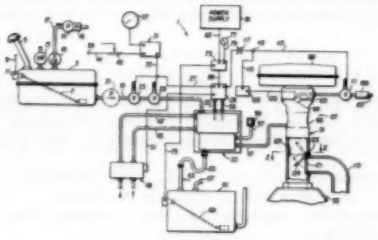
means for introducing compressed air to the hollow space, and

the hollow interior of said insert means being developed conically to present an enlarged aperture to said valve means.

4,429,675
FUEL SYSTEM FOR INTERNAL COMBUSTION ENGINES

William L. Talbert, York, Pa., assignor to Onics, Inc., York, Pa.

Continuation of Ser. No. 943,660, Sep. 18, 1978, abandoned. This application Jan. 21, 1981, Ser. No. 226,618
Int. Cl.³ F02M *31/00*
U.S. Cl. 123—558 **34 Claims**



1. A method of utilizing a liquid hydrocarbon fuel such as gasoline or the like for efficiently operating an internal combustion engine and reducing the formation of polluting products of combustion, which method comprises the steps of:

(a) providing a source of liquid hydrocarbon fuel which is capable of being combusted by an internal combustion engine and comprised of approximately two-thirds light fuel fraction and one-third heavy fuel fraction by volume;

(b) separating the hydrocarbon fuel by vaporizing the light fuel fraction into a light vapor fraction substantially in the absence of air to prevent liquid phase oxidation of the hydrocarbon fuel and maintaining the light fuel fraction in vapor form;

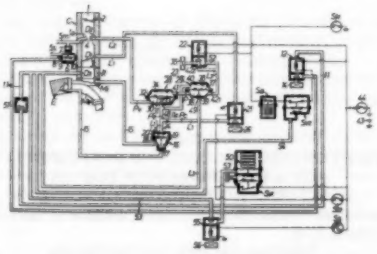
(c) carbureting substantially only the light vapor fraction into the internal combustion engine for operating same at a higher than stoichiometric air-to-fuel ratio that varies in response to engine speed and operator demand under all operating conditions; and

(d) isolating substantially only the heavy fuel fraction from the source of hydrocarbon fuel.

4,429,676
EXHAUST GAS RECIRCULATION CONTROL SYSTEM FOR VEHICLE ENGINES

Osamu Gotoh, Tokyo; Yutaka Otobe, Saitama; Michio Kawamoto, Tokyo, and Akira Fujimura, Saitama, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 228,218, Jan. 26, 1981, abandoned. This application Jul. 8, 1982, Ser. No. 396,276
Claims priority, application Japan, Feb. 2, 1980, 55-11763
Int. Cl.³ F02M *25/06*
U.S. Cl. 123—571 **12 Claims**

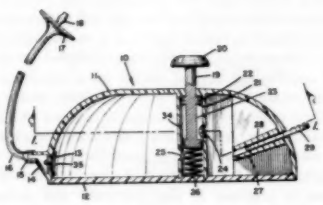


1. In an exhaust recirculation control system for an internal combustion engine for a vehicle, the engine having an intake passage with a pressure responsive auxiliary fuel supply device, and having an exhaust gas recirculation passage, the improvement comprising, in combination: a flow regulating valve in the exhaust gas recirculation passage, said flow regulating valve being actuated by suction pressure in the engine intake passage, a regulating valve means responsive to intake passage suction pressure for controlling actuating suction pressure to said flow regulating valve, a control suction air line communicating with the intake passage and said regulating valve means, means for changing the flow resistance through the control suction air line, said means being responsive to a predetermined control factor relating to an operating condition of the engine or the vehicle, whereby said flow regulating valve and said auxiliary fuel supply device are controlled in a manner such that the flow rate of exhaust gas being recirculated and the flow rate of fuel being supplied to the engine are varied in response to said predetermined control factor.

4,429,677
DISK LAUNCHING SYSTEM FOR GAMES

Ernest C. Moore, P.O. Box 24, Allano, Calif. 93544

Filed Nov. 2, 1981, Ser. No. 317,155
Int. Cl.³ F41B *1/00*
U.S. Cl. 124—62 **7 Claims**



1. A mouth-blown pneumatic system for launching disks used to play games, and the like, comprising:

(a) a hollow housing, said housing having an opening for the delivery of air thereinto, and an elongated slot therein for the passage of a disk therethrough;

(b) a baffle and housing support means immediately disposed

within said housing dividing said housing into first and second air reservoirs and providing structural support for said housing;

(c) an air value for controlling the flow of air between said first and second reservoirs being actuatable from outside of said housing, said air valve being disposed within said baffle and housing support means and formed as a part of said baffle and housing support means;

(d) a pair of lips disposed in spaced-apart relationship to permit the insertion of a disk therebetween, said lips disposed in intimate abutting relationship to the inside housing surface about said slot, said lips being disposed at an upwardly directed launching angle with respect to the slot;

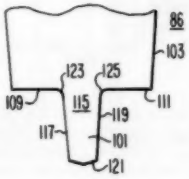
(e) a air hose, one end of which is coupled to said opening in said housing for the delivery of air thereinto and the other end used for receiving air thereinto, so that when air is blown into said other end of said air hose, air is delivered into the first reservoir and when said air valve is actuated, compressed air is delivered from said first air reservoir to said second air reservoir and into engagement with a portion of the rim of the disk disposed within said pair of lips serving as a disk launching ramp so that when said compressed air is so engaged with said disk, the disk is launched upwardly and through the slot in said housing into the air towards its intended target.

4,429,678

CUTTING STYLUS FOR MECHANICALLY CUTTING MASTERS FOR KEEL-LAPPING

Gunter John, Indianapolis; James H. Rainey, Danville, both of Ind., and Pierre V. Valembois, Cranbury, N.J., assignors to RCA Corporation, New York, N.Y.

Filed Feb. 27, 1981, Ser. No. 238,810
Int. Cl.³ B28D 5/04
U.S. Cl. 125—39 **3 Claims**



1. A cutting stylus for cutting a fully shaped groove in a metal substrate as a step in a process for lapping a keel on a playback stylus, said playback stylus being suitable for playing back prerecorded signals from a disc record groove of a given width, said keel being defined by a constricted terminal region on the tip of said playback stylus, said constricted terminal region being narrower than said given groove width, said cutting stylus comprising:

a support body;

a protrusion defined by a constricted terminal region; and shoulders joining said protrusion to said support body;

said protrusion including;

a flat cutting face having a shoulder end and a distal end;

a pair of side surfaces extending from side cutting edges of said flat cutting face, said side cutting edges being tapered to form said protrusion such that said cutting face has a beveled contour having a first thickness proximate to said shoulder end and a second thickness which is less than said first thickness proximate said distal end; and

a bottom surface extending from a bottom cutting edge of said flat cutting face;

wherein said side surfaces taper at an angle of 1 to 3 degrees such that clearance is provided to said side cutting edges during the cutting operation and said bottom surface is formed such that a clearance angle of 5 to 10 degrees is provided to said bottom cutting edge during the cutting operation;

wherein said flat cutting face of said protrusion has dimensions of approximately 4 μm deep by 2 μm wide;

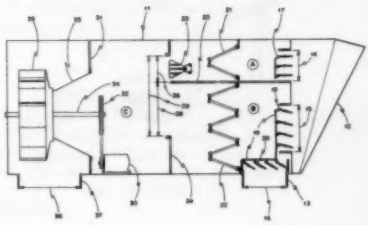
whereby said groove in said metal master is cut, in a single pass across a surface of said metal master, having a contour that is the same as the contour of said cutting face.

4,429,679

MODULAIR AIR HEATER

James V. Dirkes, Grand Rapids, Mich., assignor to Rapid Engineering, Inc., Grand Rapids, Mich.

Filed Sep. 30, 1981, Ser. No. 306,941
Int. Cl.³ F24H 3/02
U.S. Cl. 126—110 A **11 Claims**



1. A space heating apparatus comprising

a housing,

a partition structure dividing the said housing into to plurality of chambers,

a first chamber provided with:

a first profile opening of given dimensions,

a first outdoor air admitting means located upstream of the said first profile means and

a burner means suspended within the said first profile opening,

a second chamber in juxtaposition with respect to said first chamber provided with:

a second profile opening of given dimensions adjacent to and in straight line abuttment but not in communication with the said first profile opening,

a second outdoor air admitting means and an indoor air admitting means located upstream of the said second profile opening,

a third chamber in communication with each of the said first and said second chamber by means of said first and said second profile opening means respectively and provided with:

a blower means downstream of said first and said second profile openings and an air discharge means located downstream of the said blower means,

the said indoor air admitting means and said air discharge means in communication with the space to be heated,

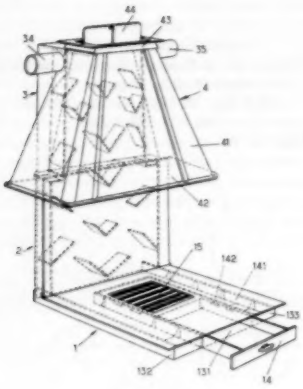
wherein the said first profile opening is in a one-to-four area airflow relationship with respect to the said second profile opening with the combined area airflow of both profile openings taken in combination with the capacity of the said blower means generating a given profile velocity over the said burner means suspended in said first profile opening; the indoor air and outdoor air mixture moved at the said profile velocity through the said second profile opening in variable complementary volume relationship as demanded by the need for pressurized make up air to sustain a given threshold static pressure in the space to be heated.

4,429,680

OPEN FIRE CONVECTOR

Michel Boidron, 136, avenue du Medoc, Le Vigean, 33320 Eysines, France

Continuation of Ser. No. 40,383, May 18, 1979, abandoned. This application Aug. 24, 1981, Ser. No. 295,458
Claims priority, application France, May 18, 1978, 78 14701
Int. Cl.³ F24B 7/00
U.S. Cl. 126—121 **2 Claims**



1. A hot air generator comprising a conduit, said conduit being characterized by a horizontal section thereof mounted on the base of the fireplace, a first vertical section detachably connected at one end to one end of the horizontal section and a second vertical section detachably connected to the other end of the first vertical section, said vertical sections extending along the back wall of the fireplace, said sections providing a continuous passageway through said conduit, the second vertical section being closed at its extreme upper end but provided with outlet openings at its sides, said horizontal section being provided internally thereof with an upstanding continuous guiding and channeling strip shaped to provide a pair of spaced parallel central legs and a pair of legs respectively spaced outwardly of the central legs, each of said central legs being provided with openings aligned with those in the other central leg of the pair, an opening in the upper wall of the horizontal section provided with a grille, a drawer slidably mounted within the horizontal section between the pair of central legs and beneath the grille, said drawer having at least two pairs of opposed openings in the sides thereof in such a manner as to be placed opposite a selected portion of the area of the openings of the said two central legs.

4,429,681

FIREPLACE GRATE ADAPTER

Samuel D. Love, 13510 Old Indian Head Rd., Brandywine, Md. 20613

Filed Jun. 16, 1981, Ser. No. 274,269
Int. Cl.³ F23H 13/00
U.S. Cl. 126—152 B **14 Claims**

1. A fireplace grate adapter for use in a fireplace, comprising:

a body portion, comprising:

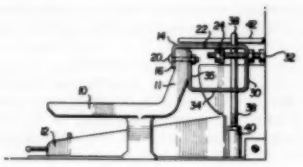
a substantially horizontal member,

a substantially vertical member connected with said substantially horizontal member, and

an aperture means in one of said substantially horizontal and vertical members;

attachment means for attaching said body portion to a fireplace grate; and

adjustable spacing means attached to said body portion and extending through said aperture means, said adjustable spacing means contacting the back wall of a fireplace thus



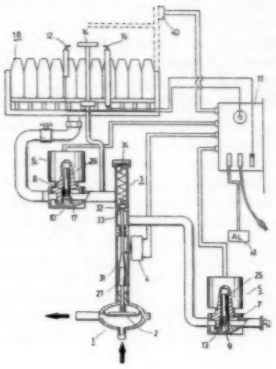
allowing the grate to be held at an adjustable distance from the back wall of the fireplace.

4,429,682

AUTOMATIC SAFETY GAS HEATING DEVICE

Ming F. Huang, No. 112, Ming-Te Rd., Pei-Tou District, Taipei, Taiwan

Continuation-in-part of Ser. No. 267,349, May 26, 1981. This application Feb. 26, 1982, Ser. No. 352,892
Claims priority, application Taiwan, Oct. 9, 1981, 6824923
Int. Cl.³ F24H 1/00
U.S. Cl. 126—351 **4 Claims**



1. An automatic safety gas heating device for water heating comprising: a valve rod externally connected to a diaphragm valve which is exerted upon by the pressure of the water;

a microswitch for an electric control board, actuated by the movement of the valve rod;

a first and a second solenoid operated valves connected in series and which are separately provided in a first gas conduit communicating with nozzles of a pilot burner and a second gas conduit communicating with nozzles of a main burner, the first and second solenoid operated valves separately actuated by the electric control board;

a third valve provided in the first gas conduit and located between the first valve and being upstream of the nozzle of the pilot burner and the second valve, actuated by the movement of the valve rod;

an igniter provided near the nozzle of the pilot burner, and actuated by the electric control board; and

a first sensor provided in the vicinity of the nozzle of the pilot burner for detecting the presence of a pilot flame and inducing the electric control board to send signals, whereby as the valve rod actuating the microswitch on and the third valve to open, the pilot flame will start to be produced while the first valve is actuated to open, immediately after the pilot flame is produced, the sensor will

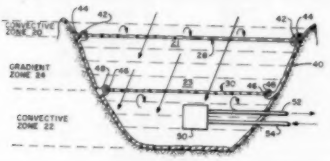
induce the electric control board to send a first electric signal to discontinue the sparking of the igniter, and to open the second solenoid operated valve and supply the gas to the main burner and ignited thereat; in the absence of the pilot flame, the sensor will induce the electric control board to send a second electric signal to continue the sparking of the igniter, and to deactuate the second solenoid operated valve and stop the gas supply to the main burner.

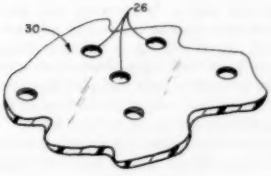
4,429,683

GRADIENT ZONE BOUNDARY CONTROL IN SALT GRADIENT SOLAR PONDS

John R. Hull, Downers Grove, Ill., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Sep. 29, 1982, Ser. No. 426,362
Int. Cl.³ F24J 3/02
U.S. Cl. 126—415 **9 Claims**





1. In a salt gradient solar pond having at least one convective layer and a non-convective salt gradient layer overlying said convective layer, the transition region between said non-convective gradient layer and said convective layer defining a zone boundary, said convective layer having a generally uniform salt concentration and temperature profile, heat derived from solar radiant energy being collected and stored in said convective layer, and said gradient layer having a salt concentration and temperature profile which increases from the upper portion of said gradient layer towards said zone boundary to enhance storage of heat in said convective layer, apparatus for suppressing migration of said zone boundary comprising:

a membrane extending horizontally across the pond at a depth corresponding to the depth of said zone boundary to inhibit the passage of turbulence from said convective layer into said gradient layer,

said membrane being of a material which is permeable to solar radiant energy and being perforated to permit vertical molecular diffusion of salt across the membrane thereby preventing the formation of a convective zone in the gradient layer in the proximity of said zone boundary, and

support means for securing the edges of said membrane at the sides of said pond.

9. In a salt gradient solar pond having a plurality of vertically oriented layers of salt water solution including upper and lower convective layers and a gradient layer disposed between said upper and lower convective layers, the transition region between said upper convective layer and said gradient layer defining an upper zone boundary and the transition region between said gradient layer and said lower convective layer defining a lower zone boundary, said upper and lower convective layers each having a generally uniform salt concentration and temperature profile, and said gradient layer having a salt concentration and temperature profile which increases from said upper zone boundary to said lower zone boundary, a method for suppressing migration of said upper and lower zone boundaries comprising:

extending a first perforated membranes horizontally across the pond at a depth corresponding to the depth of said upper zone boundary to inhibit the passage of turbulence from said upper convective layer into said gradient layer while permitting vertical molecular diffusion of salt across the membrane,

extending a second perforated membrane horizontally across the pond at a depth corresponding to the depth of the lower zone boundary to inhibit the passage of turbulence from said lower convective layer into said gradient layer while permitting vertical molecular diffusion of salt across the membrane; and,

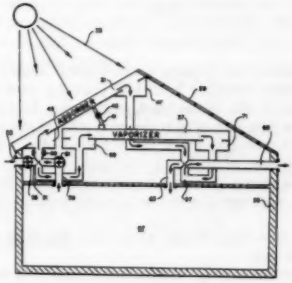
adjustably supporting the edges of said first and second membranes at the sides of said pond.

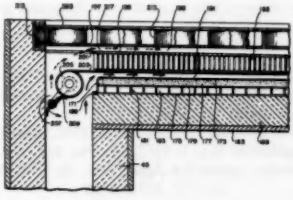
4,429,684

CHEMICAL HEAT PUMP

Leonard Greiner, 2853-A Hickory Pl., Costa Mesa, Calif. 92626

Division of Ser. No. 135,726, Mar. 31, 1980, abandoned, which is a continuation-in-part of Ser. No. 842,702, Oct. 17, 1977, abandoned. This application Nov. 12, 1981, Ser. No. 320,666
Int. Cl.³ F24J 3/02
U.S. Cl. 126—429 **1 Claim**





1. A solar energy chemical heat pump absorber panel comprising:

vapor absorbing chemical disposed in a bed portion of a transparent sealed container, said container at least partially evacuated for the transfer of water vapor in the remaining vapor transfer portion of said container;

a vapor permeable screen disposed within said sealed container between said vapor absorbing chemical and the source of sunlight, said screen coated with a substance having high infrared absorptivity and low infrared emissivity;

a first air passage for the flow of air transferring heat to and from said absorbing chemical, said air passage disposed between said source of sunlight and said transparent sealed container;

a second air passage disposed adjacent the shaded side of said transparent sealed container;

a removable shade for minimizing radiative heat loss from said absorbing chemical disposed between said absorbing chemical container and the outside environment;

a valve for selecting between heat transfer air flow through said first air passage and said second air passage; and

means disposed within said vapor transfer portion of said transparent sealed container for providing substantially uniform distribution of water vapor over said bed portion containing said absorbing chemical.

4,429,685

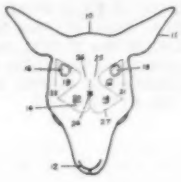
SURGICAL PROCEDURE

Timothy G. Zell, Box 982, Ukiah, Calif. 95482

Continuation of Ser. No. 175,029, Aug. 4, 1980, abandoned. This application Jul. 14, 1982, Ser. No. 398,208

Int. Cl.³ A61K *31/505*

U.S. Cl. 128—1 R **5 Claims**



1. The method of forming a one-horned animal from an animal normally having a horn bud growing from a normal position on each side of the head, comprising the steps of:

pedicling a first flap of skin on each side of the head with each flap including the adjacent horn bud at a time prior to attachment of the bud to the skull;

pedicling a second skin flap on each side of the front of the head in alignment with the general area of the pineal gland;

lifting the first flaps of skin away from the skull about the attached end;

moving the second flaps of skin into the position vacated by the adjacent first flaps of skin; and

moving the first flaps of skin into the position vacated by the second flaps with the horn buds being at a transposed position adjacent one another over the pineal gland.

4,429,686

ENDOSCOPE LIGHT SUPPLY DEVICE

Seiichi Hosoda, Fuchu, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 214,096, Dec. 8, 1980, abandoned. This application Sep. 7, 1982, Ser. No. 415,459

Claims priority, application Japan, Dec. 20, 1979, 54-166195

Int. Cl.³ A61B *1/06*

U.S. Cl. 128—6 **2 Claims**

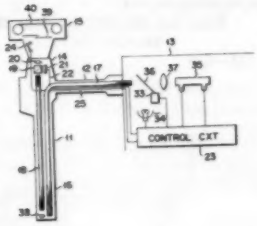
1. In an endoscope system including an endoscope light supply device to which is connected a connector of an endoscope, the endoscope including a light guide having an optical axis and an eyepiece section on which is mounted a photographing device having a releasable shutter, the light supply device comprising:

a signal source coupled to said photographing device for supplying a synchronizing signal in response to a shutter release operation of the photographing device during a photographing operation;

an electronic flash tube disposed on said optical axis of said light guide of said endoscope and selectively energizable during a photographing operation for irradiating a photographing light;

an incandescent lamp disposed on a light path substantially perpendicular to said optical axis of said light guide and emitting an observation light along said light path during an observation operation, said light path of said incandescent lamp crossing said optical axis of said light guide substantially perpendicularly at a crossing position;

a movable mirror arranged at said crossing position of said optical axis of said light guide and said light path of said incandescent lamp during an observation operation for reflecting said observation light from said incandescent lamp to said light guide along said optical axis of said light



guide, said electronic flash tube being extinguished during said observation operation;

mirror driving means coupled to said signal source and to said movable mirror for moving said movable mirror away from said crossing position in response to said synchronizing signal during a photographing operation, thereby no longer reflecting observation light to said light guide and permitting only said photographing light from said electronic flash tube to be received at the light guide during a photographing operation; and

means coupled to said signal source and to said incandescent lamp for extinguishing said incandescent lamp in response to said synchronizing signal during a photographing operation.

4,429,687

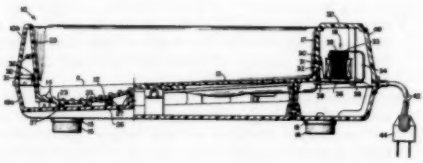
APPARATUS FOR TREATING THE FEET

Belvin F. Friedson, Miami; Arnold Thaler, Plantation, and Ivan Saud, Miami, all of Fla., assignors to Save-Way Industries, Inc., Hialeah, Fla.

Filed Dec. 29, 1981, Ser. No. 335,360

Int. Cl.³ A61H *21/00*

U.S. Cl. 128—24.2 **13 Claims**



1. Apparatus for treating the feet comprising: a casing having exterior walls, inwardly spaced interior side walls and an open top which define a tub for receiving and containing liquid, such liquid being exposed to ambient air under all conditions of operation, said tub having an unobstructed interior space defined by a floor and said interior side walls extending upwardly around the periphery thereof; a pair of foot receiving stations located in the floor; lower heating means including a rope heating element mounted in a channel located in the

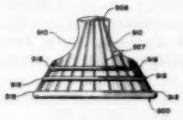
lower surface of the floor beneath the foot receiving station, said rope heating element extending the length and width of said foot receiving station in a series of U-shaped or serpentine curves, said channel serving to distribute the heat provided by said first heating means ; upper heating means including a rope heating element mounted in brackets extending at intervals between the exterior walls and the side walls, said brackets serving to distribute the heat provided by said second heating means, said upper heating means extending around the periphery of said interior side walls and being concentrated at a location spaced at a distance above the floor corresponding to the approximate upper level to which liquid is received in said tub for providing a concentrated quantity of heat to the upper surface of liquid within said tub.

4,429,688

MEDICAL APPLIANCE FOR PERCUSSIVE RESPIRATORY THERAPY

Peter B. Duffy, 4639-1/2 Tujunga, North Hollywood, Calif. 91602

Filed Dec. 8, 1980, Ser. No. 213,818
Int. Cl.³ A61H *31/00*
U.S. Cl. 128—28 **2 Claims**



1. A medical appliance for use in percussive respiratory therapy, said apparatus comprising:

an open ended cup-like enclosure means in the shape of a truncated cone for substantially sealing pneumatically with the body surface of a person by resiliently conforming to the body contour upon impact;

a portion of said cone being adapted to provide gripping means for the user, said gripping means including:

two opposing concave regions on opposite sides of the cone for holding it between two fingers; and

surface irregularities on the substantially planar exterior surface below the concave regions for enhancing the grippability of the appliance with the other fingers of the user;

said open end of the cone defining an inward curling semi-circular lip; and

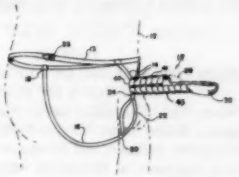
a resiliently deformable annular ring defining a groove therein to communicate with the interior and exterior portions of said curling semi-circular lip, said annular ring also defining a cavity filled with compressible gasseous vapor in the portion of the ring in communication with the exterior portion of the curling semi-circular lip, for cushioning the impact of said appliance upon the body of a patient.

4,429,689

SEX AID DEVICE FOR MALES

Procopio U. Yanong, 1900 Half Day Rd., Bannockburn, Ill. 60015

Filed May 26, 1982, Ser. No. 382,253
Int. Cl.³ A61F *5/42*
U.S. Cl. 128—79 **9 Claims**



1. A sex aid device for use with a penis, comprising a generally tubular member adapted to receive a penis,

said tubular member being adapted to extend from the base of and terminate dorsally just behind the glans penis of an unerect penis,

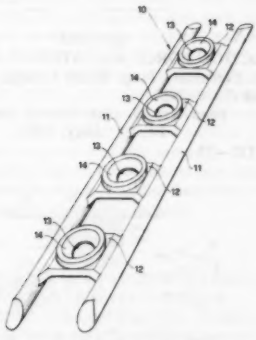
and which tubular member includes at least one relatively inelastic but flexible longitudinally extending support member which extends from the base to the tip of the penis ventrally to receive the ventral portion of the glans penis while allowing the dorsal portion thereof to be free to receive tactile stimulation; said support member having a spoonlike forward extension member and having a forward-projecting tip of soft compressible elastic material affixed to said extension member and shaped to form an artificial glans penis.

4,429,690

PLATE FOR BROKEN BONE FIXATION

Giancarlo Angelino-Pievani, Pioltello, Italy, assignor to Cise Centro Informazioni Studi Esperienze SpA, Italy

Filed Aug. 24, 1981, Ser. No. 295,469
Claims priority, application Italy, Sep. 15, 1980, 24658 A/80
Int. Cl.³ A61F *5/04*
U.S. Cl. 128—92 D **4 Claims**



1. A plate for treatment of bone fractures by joining parts of a broken bone across the fracture line by screw attachment to the parts to be joined comprising

a framework plate including

a pair of longitudinal bars having convex undersurfaces supporting said framework plate while lying in a longitudal direction along the broken bone with each of

said bars supported on opposite sides of the fracture in said broken bone,

a plurality of cross-bracket bridging members with each of said members integrally connected to each of said longitudinal bars and extending therebetween, said cross-bracket bridging members spaced along said longitudinal bars and from each other with open spaces therebetween,

each of said bridging members having a hole therethrough for holding a screw for attachment to a bone part.

4,429,691

METHOD FOR FILLING IN DEFECTS OR HOLLOW PORTIONS OF BONES

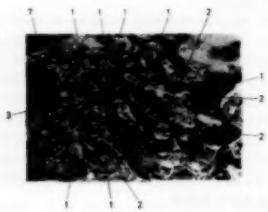
Shigeo Niwa, Aichi; Kazuhiko Sawai; Shinobu Takahashi, both of Nagoya; Hideo Tagai, Tokyo; Mikiya Ono, Saitama; Yoshiaki Fukuda, Saitama, and Hiroyasu Takeuchi, Saitama, all of Japan, assignors to Mitsubishi Mining and Cement Company, Ltd., Tokyo, Japan

Division of Ser. No. 191,894, Sep. 29, 1980, abandoned. This application Jan. 25, 1982, Ser. No. 342,259

Claims priority, application Japan, Oct. 8, 1979, 54-128821

Int. Cl.³ A61F *1/00*; C01B *25/32*

U.S. Cl. 128—92 C **16 Claims**



1. A method of treating bones with a filler, wherein defects or hollow portions of bones are filled with fluidized or plasticized powders of a calcium phosphate compound having the apatite crystalline structure of each crystal grain size of from 50 Å to 10 microns and represented by the general formula of $Ca_m(PO_4)_nOH$ $(1.33 \leqq m/n \leqq 1.95)$, and wherein at least a portion of said filler is filled in to reach the bone-marrow cavities of said bones.

4,429,692

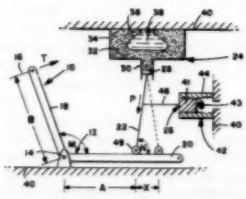
TRACTION FORCE ADJUSTMENT APPARATUS

George A. Carruthers, Forge Bridge Cottage, Caton, Lancaster, England (LA 2 9NB)

Filed May 29, 1981, Ser. No. 268,129

Int. Cl.³ A61H *1/02*

U.S. Cl. 128—75 **18 Claims**



1. Apparatus for application of traction force to patient, comprising:

a. cord means for applying a constant traction force to the patient;

b. a lever rotatable about a pivot and capable of being connected to said cord means remote said pivot;

c. a member journaled against said lever and movable therealong;

d. means for biasing said member against said lever with a force independent of displacement of said member along said lever in a direction generally transverse to the portion of said lever against which said member is journaled to maintain a predetermined traction force substantially constant; and

e. adjustable means for displacing said member along said lever as force is applied by said biasing means thereby changing distance between said pivot and where said member is journaled against said lever thereby changing force applied to said cord means to set said predetermined traction force.

4,429,693

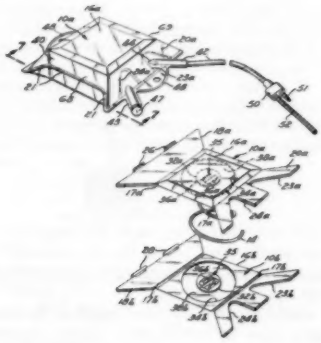
SURGICAL FLUID EVACUATOR

Larry W. Blake, 2885 Regis La., Costa Mesa, Calif. 92626; Ervin R. Harvel, 23991 Lindley, Mission Viejo, Calif. 92675; Duane R. Mason, 31 Farragut, Irvine, Calif. 92664, and George M. Wright, 24145 Puerta Deluz, Mission Viejo, Calif. 92675

Filed Sep. 16, 1980, Ser. No. 187,711

Int. Cl.³ A61M *1/00*

U.S. Cl. 604—73 **28 Claims**



1. A surgical evacuation device for drawing fluid from a wound, comprising:

a compressible reservoir, having a pair of structural walls, and a flexible wall member, extending from said structural walls, to seal said reservoir from the atmosphere, the geometrical configuration of said reservoir controlled by said structural walls, as said reservoir expands;

a fluid collection tube connected to said reservoir for draining fluid from said wound to said reservoir; and

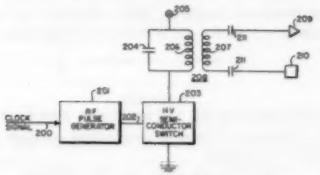
spring means for providing a biasing force in the direction of expansion of said reservoir, said force biasing said structural walls apart to expand said reservoir and create a vacuum therein, said force decreasing as said reservoir expands, said geometrical configuration producing a wall area projected in the direction of said biasing force, and acted upon by said biasing force, which area decreases as said reservoir expands to at least partially offset the decreasing biasing force provided by said spring to reduce changes in reservoir vacuum and maintain vacuum level.

4,429,694

ELECTROSURGICAL GENERATOR

Francis T. McGreevy, Aurora, Colo., assignor to C. R. Bard, Inc., Murray Hill, N.J.

Filed Jul. 6, 1981, Ser. No. 281,005
Int. Cl.³ A61B *17/39*
U.S. Cl. 128—303.14 **26 Claims**



1. An electrosurgical generator for performing surgical operations on a tissue mass comprising:

an active electrode,

a return electrode,

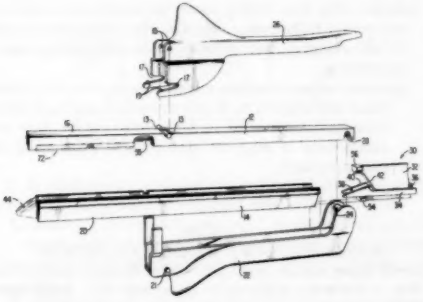
means for generating a damped oscillatory open circuit output voltage waveform across said electrodes, said waveform being substantially of the form $e^{-\zeta\omega_n t}$ sin $(\omega_n\sqrt{1-\zeta^2}t+\phi)$, where e is the base of the natural logarithm, ω_n is the undamped, natural frequency, ζ is the damping factor and is equal to or less than 0.038, but greater than 0 and ϕ is a phase angle, said generating means generating a loaded output voltage waveform across said electrodes after an electrical arc forms between said tissue mass and said active electrode, said loaded waveform being substantially of the form $e^{-\zeta\omega_n t}$ sin $(\omega_n\sqrt{1-\zeta^2}t+\phi)$, where e is the base of the natural logarithm, ω_n is the undamped, natural frequency, ζ is the damping factor and is substantially greater than 0.038.

4,429,695

SURGICAL INSTRUMENTS

David T. Green, Norwalk, Conn., assignor to United States Surgical Corporation, Norwalk, Conn.

Continuation of Ser. No. 118,664, Feb. 5, 1980, abandoned. This application Jul. 1, 1982, Ser. No. 394,132
Int. Cl.³ A61B *17/04, 17/11*
U.S. Cl. 128—305 **19 Claims**



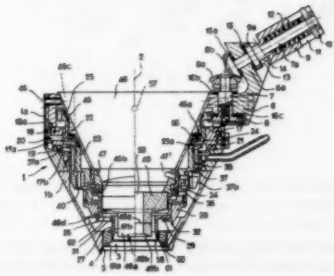
16. A surgical instrument for use in fastening living tissue comprising upper and lower cooperating elongated jaws movable between open and closed positions, whereby tissue to be fastened may be gripped between said jaws when said jaws are in the closed position, means associated with one of said jaws for mounting a tissue fastening means, a pusher means movable longitudinally relative to said jaws when said jaws are in said closed position for forcibly expelling said fastening means from said one jaw and causing said fastening means to penetrate tissue gripped between said jaws, and jaw support means carried by said pusher means, said jaw support means cooperating with said jaws during movement of said pusher means along said jaws for resisting forces tending to separate said jaws during expulsion of said fastening means.

4,429,696

SURGICAL APPARATUS FOR PRECISELY CUTTING OUT THE CORNEA

Khalil Hanna, Paris, France, assignor to Sevifra S.A., Paris, France

Filed Jul. 21, 1981, Ser. No. 285,684
Claims priority, application European Pat. Off., May 11, 1981, 81400745.6; France, Sep. 3, 1980, 80 19014
Int. Cl.³ A61B *17/32*
U.S. Cl. 128—310 **34 Claims**



1. A trephine for making a circular incision in the cornea of an eye, said trephine comprising:

(a) a tubular support having an axis and being provided with a base portion having a front surface for application to the eye,

(b) a blade carrier coaxial with, and movable within, said support, said blade carrier having a front portion,

(c) a cylindrical blade coaxial with said support mounted on the front portion of said blade carrier, said blade having a circular cutting edge,

(d) drive means for simultaneously rotating and axially translating said blade carrier with respect to said support, the translatory movement serving to project the blade cutting edge from and retract it into the base portion of said support, and

(e) means for preventing the translatory movement but permitting the rotary movement of said blade carrier, upon operation of said drive means, after the cutting edge of said blade reaches a predetermined location of projection from the base portion of said support,

whereby the cutting edge of the blade can be rotated within an incision without being retracted from the incision or moving forward to deepen the incision.

4,429,697

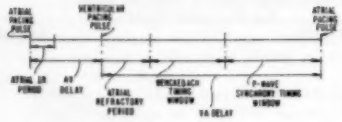
DUAL CHAMBER HEART PACER WITH IMPROVED VENTRICULAR RATE CONTROL

Tibor A. Nappholz, Drummoyne; Ronald C. Bradbury, Marsfield, and Bruce R. Satchwell, Pymble, all of Australia, assignors to Telectronics Pty. Ltd., Lane Cove, Australia

Filed Apr. 12, 1982, Ser. No. 367,427
Int. Cl.³ A61N *1/36*
U.S. Cl. 128—419 PG **119 Claims**

1. A heart pacer comprising means for sensing atrial beats; means for generating ventricular pacing pulses; means responsive to said atrial beat sensing means for determining the atrial rate as a function of the number of atrial beats which occur during a mesurement interval which is sufficiently long to

allow an average value to be determined; and means for controlling said ventricular pulse generating means to operate in synchronism with said atrial beat sensing means when said atrial rate is below a predetermined atrial upper rate, for controlling said ventricular pulse generating means to operate at a



constant rate independent of said atrial beat sensing means when said atrial rate is above said predetermined atrial upper rate, and for controlling the operating rate of said ventricular pulse generating means to decrease gradually toward said constant rate following said atrial rate first rising above said predetermined atrial upper rate.

4,429,698

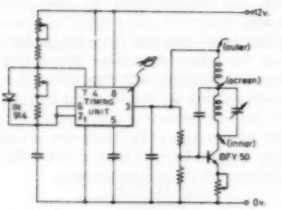
HIGH FREQUENCY ELECTROMAGNETIC THERAPY APPARATUS

Richard H. C. Bentall, P.O. Box 47, London, W11, England

Continuation of Ser. No. 74,926, Sep. 13, 1979, abandoned. This application Nov. 10, 1980, Ser. No. 205,749

Int. Cl.³ A61N *1/40*

U.S. Cl. 128—422 **5 Claims**



1. A high frequency electromagnetic therapy apparatus, comprising:

a power supply;

a flexible inductor of generally circular configuration forming an antenna which is positionable on an area of a body to be treated; and,

a high-frequency, low-energy signal oscillating circuit for generating a high-frequency, low-energy electromagnetic field radiated from the inductor-antenna, at a power level in the milliwatt range, into the area of the body to be treated at an adsorbed power level in the same power range, which promotes healing of body tissue, but which is too small to significantly heat the body tissue, the frequency of said radiated field being controlled by an inductive-capacitive tuned circuit, said inductor-antenna forming all of the inductive portion of the tuned circuit, the power level of the adsorbed field being independent of differences in capacitive coupling between the inductor-antenna and different parts of the body to be treated, the differences in coupling resulting in negligible power loss of the adsorbed field relative to the radiated field and inconsequential frequency shift, whereby an impedance matching circuit for the antenna is unnecessary.

4,429,699

BLOOD PRESSURE MEASURING EQUIPMENT

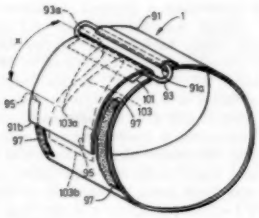
Rudolf A. Hatschek, Fribourg, Switzerland, assignor to Asulab AG, Biel, Switzerland

Filed Feb. 12, 1981, Ser. No. 235,561

Claims priority, application Switzerland, Feb. 18, 1980, 1299/80

Int. Cl.³ A61F *00/00*

U.S. Cl. 128—681 **9 Claims**



1. Blood pressure measuring equipment comprising

a sleeve attachable to a limb of a person, said sleeve defining a chamber inflatable by fluid and being provided with a measurement transducer for measuring the circumference or diameter of a limb to which said sleeve is attached, said transducer comprising two electrodes so arranged on said sleeve as to provide, when said sleeve is attached to a limb, a capacitor having a capacitance dependent on the circumference of the limb,

a pressure sensor for detecting fluid pressure in said chamber, and

pressure value determining means electrically connected to said sensor to determine values of detected pressure levels in said chamber, said pressure value determining means comprising

pressure value correcting means connected to said transducer and adapted to correct at least some of said determined pressure values in dependence on the limb circumference or diameter measurement determined by said transducer.

4,429,700

BLOOD PRESSURE MEASURING DEVICE

Richard Thees, Aachen, and Rolf Wilden, Roetgen, both of Fed. Rep. of Germany, assignors to Honeywell B.V., Amsterdam, Netherlands

Filed Feb. 2, 1981, Ser. No. 230,829

Claims priority, application Fed. Rep. of Germany, Feb. 4, 1980, 3004011

Int. Cl.³ A61B *5/02*

U.S. Cl. 128—681 **8 Claims**

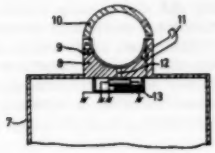
1. A blood pressure measuring device comprising:

cuff means which function to apply pressure to a body part;

fluid reservoir means which communicate with the interior of the cuff;

a liquid having a boiling point between 290° K. and 340° K. disposed in the reservoir means;

means for measuring pressure in the cuff;



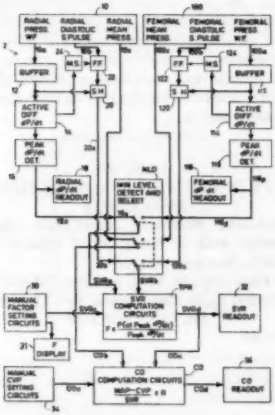
electric heating means disposed in the liquid which function to heat the liquid above its boiling point to increase vapor pressure in the cuff.

4,429,701

METHOD AND APPARATUS FOR MEASURING THE SYSTEMIC VASCULAR RESISTANCE OF A CARDIOVASCULAR SYSTEM

Daniel Goor, 4 Uri St., Tel Aviv, and Raphael Mohr, Shikun Rofim 19/6, Tel Hashomer, both of Israel

Filed Sep. 22, 1981, Ser. No. 304,596
Int. Cl.³ A61B 5/02
U.S. Cl. 128—713 **19 Claims**



1. A method of examining and indicating the status of the cardiovascular system of a subject, comprising the steps:

A. detecting the arterial pressure of the subject and generating in response thereto a blood-pressure signal having a waveform in accordance with the detected arterial pressure;

B. differentiating said blood-pressure signal to produce a dP/dt signal having a waveform varying in accordance with the rate at which the blood-pressure signal varies;

C. detecting the peak of said dP/dt signal to determine the peak dP/dt;

D. determining a value which is substantially equal to the arterial pressure at the time of said peak dP/dt;

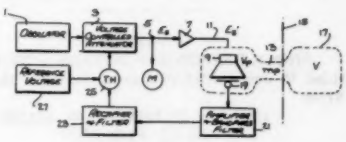
E. dividing said latter value by said peak dP/dt signal, thereby producing a measurement corresponding to the systemic vascular resistance of said cardiovascular system.

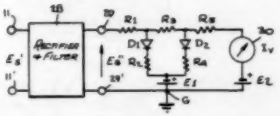
4,429,702

APPARATUS FOR MEASUREMENT OF ACOUSTIC VOLUME

Daniel R. von Recklinghausen, Arlington, Mass., assignor to Electro Audio Dynamics, Inc., Great Neck, N.Y.

Filed Jun. 22, 1981, Ser. No. 275,866
Int. Cl.³ G01N 29/00
U.S. Cl. 128—746 **7 Claims**





1. In an apparatus for measuring acoustic volumes in human ears utilizing a hollow ear probe housing a sound transducer in combination with a microphone for transmitting into and receiving sound signals from said acoustic volume and an electrical circuit for feeding a signal to said transducer and generating an output from said microphone proportional to said volumes the improvement comprising a compensating nonlinear network incorporated in said electrical circuit and including elements for offsetting the nonlinearities in the combination of said probe and said transducer and said microphone for producing linear measurements of volume with improved accuracy, said probe having a wide-mouthed coupling with the measured ear canal with the resonance volume of the said acoustic volume and the probe volume being above that of the frequency of the signal being applied to the sound transducer.

4,429,703

CIGARETTE SUBSTITUTE

William Haber, 5812 Donna Ave., Tarzana, Calif. 91356

Filed Feb. 22, 1982, Ser. No. 350,721
Int. Cl.³ A24F 47/00
U.S. Cl. 131—273 **7 Claims**

3. A cigarette substitute assembly comprising:

a hollow elongated cylindrical tube, said tube being a smooth plain hollow tube with inner and outer continuous cylindrical surfaces from end to end;

a mouthpiece making a tight fit into one end of said tube to form one end member of said assembly;

a second end member of said assembly, resembling the ashes of a cigarette making a tight fit into the other end of said tube, said second end member being hollow and having at least one opening at the outer end thereof;

aromatic cartridge means for producing a pleasing taste and smell when air is drawn over it, mounted within said assembly;

both of said end members including individual spaced finger means extending longitudinally away from the end mem-

bers and into said tube to firmly engage said tube and to secure said end members to said tube; and

means for engaging and holding said aromatic cartridge means within said tube and spaced from the side walls thereof, and with the ends of said cartridge open and spaced from said fingers;

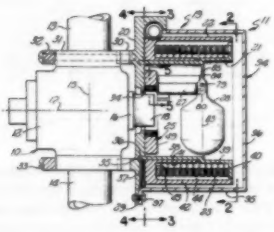
whereby the user may taste and smell the harmless aromatic flavor from the cartridge while holding the cigarette substitute in the mouth and drawing air through the assembly thus aiding the user in stopping smoking.

4,429,704

SHOCK RESPONSIVE ROTARY ACTUATOR

Mitchel R. Jones, 1214 Pontenova, Hacienda Heights, Calif. 91745

Filed Nov. 23, 1981, Ser. No. 323,755
Int. Cl.³ F16K *17/36*
U.S. Cl. 137—45 **16 Claims**



1. A shock responsive actuator for turning a stem of a valve or the like about an axis between first and second positions comprising:

a body structure;

a member mounted for rotary movement in opposite directions about said axis relative to said body structure and through a range of pivotal movement greater than that of said stem between said first and second positions thereof;

spring means yieldingly urging said member in a first of said rotary directions relative to said body structure and resisting movement of said member in the opposite rotary direction;

means forming a lost motion connection between said member and said stem for transmitting rotary movement about said axis from said member to said stem and enabling limited rotary movement of said member relative to said stem;

latch means for releasably retaining said member against rotary movement in said first direction relative to said body structure and from a predetermined cocked position in which said stem is in said first position thereof; and

inertia actuated weight means responsive to earthquake forces or other shock forces to release said latch means and permit spring induced rotary movement of said member in said first direction in a relation first turning said member through an angle relative to said stem and then turning said stem with said member from said first position to said second position of the stem.

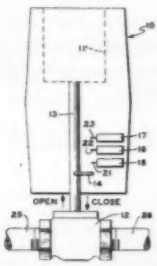
4,429,705

MANUALLY ACTUATED FUEL VALVE CONTROL

Stuart T. Ritchart, Burnsville, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Feb. 5, 1982, Ser. No. 346,334
Int. Cl.³ F23D *5/16*
U.S. Cl. 137—65 **9 Claims**

1. A manually initiated, hydraulically operated fuel valve, including: hydraulic actuator means including an electrically operated pump to provide a hydraulic actuating force to move an actuator member against a load, and an electrically operated dump valve to bypass said hydraulic actuator means to allow said load to return said actuator member to a starting position upon said dump valve being deenergized; said load including bias means and a fuel valve; electric source means for energizing said actuator means; a first electric circuit connected to said electric source and said actuator means with said first electric circuit including a momentary manual start switch, and manual reset switch means connected in series to provide an initial energizing circuit for said actuator means; said reset switch means requiring manual reset after operation; second electric circuit means including a normally open control switch means which when closed short circuits said manual



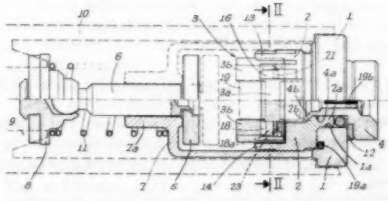
start switch and said manual reset switch means; third electric circuit means connecting said dump valve and said pump motor in parallel circuit with said third electric circuit means including normally closed limit switch means which is open circuited when said actuator member moves said valve to an open position; and said actuator member including operator means to sequentially operate said control switch means, said manual reset switch means, and said limit switch means to provide a manual start sequence for said actuator means, but wherein said manual reset switch means ensures that said manual start switch cannot be blocked into a start position to control said actuator means.

4,429,706

SAFETY DEVICE FOR GAS-FIRED HEATING APPARATUS

Bernard Weichlein, Besancon; Jean-Claude Chatelain, and Denis Gaihier, both of Beure, all of France, assignors to Madec Mater, Servance, France

Filed Aug. 20, 1981, Ser. No. 294,433
Claims priority, application France, Sep. 17, 1980, 80 20032
Int. Cl.³ F23D *5/16*
U.S. Cl. 137—66 **4 Claims**



1. In a safety device for gas-fired heating apparatus, constituted by an assembly mounted in a gas supply pipe and comprising an electromagnetically controlled valve of which the mobile obturator element cooperates hermetically with a seat made in said supply pipe, and mobile element being connected to a push rod, a spring urging said mobile element in the sense of closure of the valve, a metal plate, means coupling said mobile element to said metal plate, an electromagnet, said

metal plate and electromagnet being constructed and arranged so that said metal plate may be drawn by the core of said electromagnet excited by a detector for detecting normal functioning of the gas-fired apparatus, an electrically insulating intermediate element mounting said core on a metal support in the form of a circular ring, said ring being electrically connected to one of the ends of the excitation winding of the electromagnet and receiving a protecting casing which constitutes a longitudinal guide for the pushrod, and also a metal connector element electrically insulated from the support and ensuring the electrical connection of the other end of the excitation winding, and the intermediate element presents at least one substantially cylindrical portion extending between the opposite cylindrical zones of the support end of the connecting element, wherein said intermediate element is made of electrically insulating material, is elastically deformable and presents a plurality of arms extending longitudinally to form a housing for the core, at least certain of said arms being provided with hooking members or the like, whilst the connector element is fixed on said intermediate element by crimping of one of its ends.

4,429,707

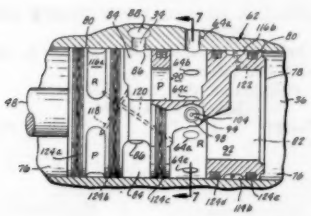
HYDRAULIC POWER TRANSFER UNIT

Wilfred E. Boehringer, Fullerton, Calif., assignor to McDonnell Douglas Corporation, Long Beach, Calif.

Division of Ser. No. 933,558, Aug. 14, 1978, Pat. No. 4,286,927. This application May 26, 1981, Ser. No. 266,961

Int. Cl.³ F17D *3/00*

U.S. Cl. 137—625.21 **10 Claims**



1. Vane means for use in switching hydraulic ports formed in a cylindrical surface, said vane means including:

a main body portion having a top, bottom, sides, and a vane passageway formed therethrough from top to bottom for communicating any hydraulic pressure in the port being switched from said top to said bottom;

a wiper portion connected to said main body portion at the top thereof;

a ring-shaped surface formed on said wiper portion, said ring-shaped surface having a surface contour which is a portion of a cylinder so that it can mate for sliding contact with the cylindrical surface; and

a ring-shaped undersurface adapted to have hydraulic pressure applied thereto discontinuous from said bottom, whereby the force by which said ring-shaped surface held against the cylindrical surface is dependent upon the area of said ring-shaped undersurface and the hydraulic pressure applied thereto, said main body portion isolating the hydraulic pressure applied to said ring-shaped undersurface by hydraulic pressure in the port being switched.

4,429,708

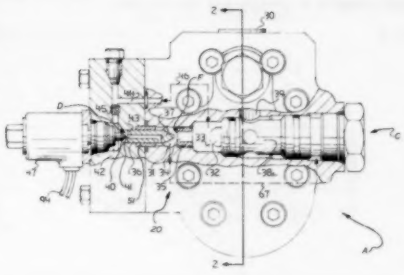
FLUID FLOW CONTROL

Timothy C. Strueh, Lafayette, Ind., assignor to TRW Inc., Cleveland, Ohio

Continuation of Ser. No. 23,024, Mar. 22, 1979, abandoned. This application Oct. 14, 1981, Ser. No. 311,183

Int. Cl.³ F16K *31/02*

U.S. Cl. 137—117 **13 Claims**



1. Apparatus comprising a pump for pumping fluid from an inlet to an outlet, means defining a variable orifice in said outlet for regulating fluid flow through said outlet, a fluid bypass valve adjacent to said variable orifice being directly responsive to the pressure drop across said orifice for bypassing selected amounts of fluid from a point upstream of said variable orifice to said inlet so as to cause the pressure drop across said orifice to remain substantially constant as the size of said orifice is varied and if the pressure upstream of the orifice varies, said means defining said variable orifice including a valve seat and a pintle member movable relative to said valve seat between different positions in which said pintle member is spaced from said valve seat to thereby control the size of the orifice, said pintle member having first and second ends, said first end of said pintle member being located proximate said valve seat and being effective to restrict fluid flow through said valve seat to an extent which is dependent upon the position of said pintle member, said pintle member being positioned by the application of a pressure differential acting on said first and second ends thereof, means defining a pressure chamber adjacent to and in fluid communication with said second end of said pintle member, means defining a passage for supplying said chamber with fluid, means defining a fluid discharge passage for directing fluid from said chamber to said first end of said pintle member, a pilot member relative to said fluid discharge passage for controllably restricting the rate at which fluid flows from said chamber and thereby controlling the pressure differential across said pintle member and thus the position of said pintle member, and an electrical solenoid operable to position said pilot member in response to an electrical signal applied thereto, whereby variation of the amplitude of said electrical signal results in a corresponding variation in the fluid flow through said outlet.

4,429,709

CASCADE-BASED METHOD AND DEVICE FOR FLUID HANDLING AND MEASUREMENT

Erkki J. Niskanen, Länsituulentie 8A16, 02100 Espoo 10, Finland

Filed Oct. 30, 1981, Ser. No. 316,819

Int. Cl.³ F16K *24/00*

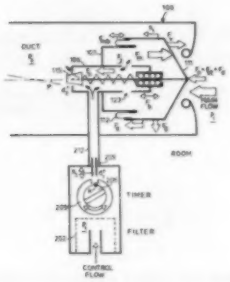
U.S. Cl. 137—220 **12 Claims**

1. A device for maintaining constant rates of air flow in an air conditioning system, comprising:

a valve housing, sealably disposed within the inlet end of an exhaust duct for the air flow and fitted with a combined main valve seat and cover;

a cylinder enclosure, fixably mounted and supported within said housing in a space of lower pressure, said enclosure fitted with an inlet opening for control air, connected to a space of higher pressure upstream in the air flow, and an outlet opening connected to the space of lower pressure downstream in the air flow;

a combined piston and main valve disc, capable of axial displacement in alignment with the axis of said enclosure and joined to it flexibly and hermetically;



a shaft, capable of axial displacement and disposed in a linear bearing for purposes of supporting and aligning the movement of said combined piston and main valve disk; and

means for control of the area of said outlet opening and for changing a resultant of forces opposing the force of said combined piston and main valve disk, said means including a fixably mounted control valve seat, a control valve cone, mounted on said shaft and having a predertermined geometrical form to comply with predetermined displacement/pressure difference ratio, and spring means for changing said resultant of said opposing forces.

4,429,710

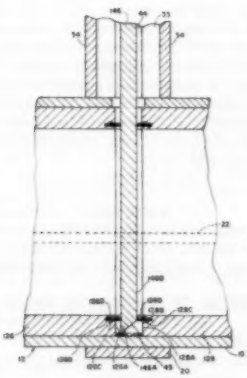
SLURRY GATE VALVE

Robert G. Grieves, Tampa, and Roscoe Richter, Lakeland, both of Fla., assignors to GIW Southern Valve, Inc., Grovetown, Ga.

Continuation-in-part of Ser. No. 235,420, Feb. 17, 1981, abandoned. This application Oct. 6, 1982, Ser. No. 433,035

Int. Cl.³ F16K *37/00, 3/00*

U.S. Cl. 137—375 **7 Claims**



1. A slurry gate valve comprising in combination:

a cylindrical conduit portion;

a first end of said conduit portion;

a second end of said conduit portion, said first and said second ends being in opposed relationship to each other;

a first annular bolt flange disposed adjacent said first end of said conduit portion;

a second annular bolt flange disposed adjacent said second end of said conduit portion;

a first face of said first bolt flange;

a first face of said second bolt flange;

a plurality of bolt holes defined by said first faces of said first and said second bolt flanges;

a first sleeve liner extending from said first face of said first bolt flange inwardly relative to said conduit portion;

a second sleeve liner extending from said first face of said second bolt flange inwardly relative to said conduit portion;

a first inward face of said first sleeve liner;

a first inward face of said second sleeve liner;

an annular slot defined by said first inward faces of said first and said second sleeve liners;

an annular channel defined by said first inward face of said first sleeve liner;

an annular channel defined by said first inward face of said second sleeve liner;

an annular wiping seal disposed within each of said annular channels;

a gate housing portion secured adjacent said conduit portion;

a gate slidably disposed within said gate housing, said gate including a first and a second surface, said annular wiping seal of said first sleeve liner cooperating with said first surface of said gate, said annular wiping seal of said second sleeve liner cooperating with said second surface of said gate in wiping relationship thereto;

a circular slot defined by said conduit portion, said circular slot being enclosed by said gate housing and in planar alignment with said gate and said annular slot; and

an undercut key portion disposed adjacent each of said annular channels.

4,429,711

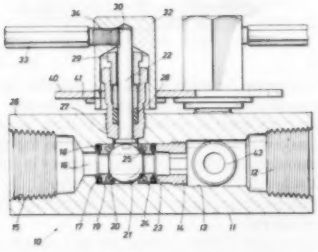
MULTIVALVE MANIFOLD INTERLOCK AND CONTROL SYSTEM

Marion L. Schomer, Houston, Tex., assignor to Anderson Greenwood & Co., Bellaire, Tex.

Filed Mar. 8, 1982, Ser. No. 355,476

Int. Cl.³ F16K *35/14*

U.S. Cl. 137—385 **16 Claims**



1. A multivalve manifold for interconnecting a pair of fluid signals to a sensor comprising:

(a) a solid, rectangular valve body means having

(1) a pair of adjacent inlet ports on one said of said body means;

(2) a pair of adjacent outlet ports on an opposing side of said body means; and

(3) a pair of interconnecting passages in said body means extending between said inlet and outlet ports;

(b) first and second valves in said body means opening and closing fluid flow through said passages;

(c) third valve in said body means opening and closing a pas-

sage between said interconnected passages downstream from said first and second valves;

(d) first, second and third valve stems connected to said first, second and third valves, respectively, and extending from said body means parallel to the other of said valve stems, each of said valve stem being enclosed by a valve stem cover dependent on rotation of said valve stems to a specified angular position;

(e) interlock means connected to said valve stems cooperatively

(1) preventing two of said valve stems from rotating while permitting one of the three valve stems to rotate;

(2) permitting only one of said two valve stems to rotate after said one of said valve stems has rotated;

(3) permitting the last of said valve stems to rotate after rotation of two of said valve stems;

(4) wherein rotation is between full open and closed valve positions; and

(f) lock bar means being mounted about said valve stem covers for securing at least two of said valve stems against operation, said lock bar means being selectively removeable to enable operation of said valve stems.

4,429,712

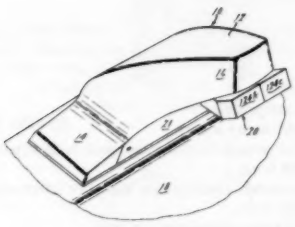
FAUCET

Robert D. MacDonald, Mesa, Ariz., assignor to Masco Corporation, Taylor, Mich.

Filed Mar. 12, 1981, Ser. No. 243,090

Int. Cl.³ F16K *19/00*

U.S. Cl. 137—606 **4 Claims**



1. A faucet comprising a housing, a passageway passing through said housing and having an inlet and an outlet, a seat formed intermediate said inlet and said outlet, a slideway cavity in said housing adjacent to said seat, a flat cantilever spring secured at one of its ends to said housing and disposed at the other of its ends in said slideway cavity, a first surface of a portion of said spring overlying said seat, a flexible valve member secured in said housing between said portion of said spring and said seat, a movable element disposed in said slideway cavity and engaging a second surface of said portion of said spring remote from said valve member, and selectively operable control means fastened to said element and selectively operable to move said element within said slideway cavity along said second surface of said spring; whereby movement of said movable element along said spring urges said other end of said spring against said valve member and towards said seat to thereby regulate the rate of discharge of fluid from said inlet to said outlet by varying the amount of deflection of said spring and the distance between said valve member and said seat.

4,429,713

SNAP CLOSURE COUPLING FOR FLOWING-MEDIA DUCTS

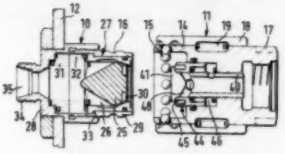
Friedrich C. Walter, Karlsruhe, Fed. Rep. of Germany, assignor to Argus Verwaltungsgesellschaft mbH, Ettlingen, Fed. Rep. of Germany

Filed Jun. 19, 1981, Ser. No. 275,350

Claims priority, application Fed. Rep. of Germany, Nov. 6, 1980, 3041909

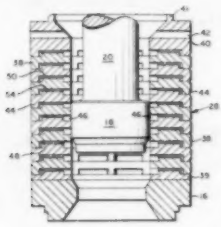
Int. Cl.³ F16L *37/28*

U.S. Cl. 137—614.03 **4 Claims**



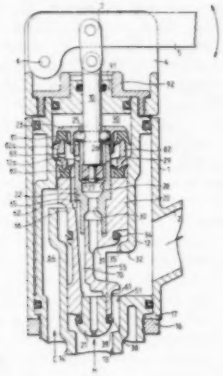
1. Snap closure coupling for flowing medium ducts with closure pieces arranged to be movable axially in two coupling halves (**10**, **11**) which are in the form of a plug valve and a sleeve valve and are pluggable into each other and are lockable in the coupling position, said closure pieces being loaded in the closing direction by closing springs (**31**, **46**) and, when the coupling halves are separated, being held in closing position with a respectively associated seating surface of the respective coupling half, one of the closure pieces (**25**, **44**) being constructed as a valve cone (**25**) received within a sleeve (**44**) having a valve seating surface and the other as valve seat (**42**) enclosing a spigot-like (**40**) valve seat firmly arranged in the associated coupling half, and constantly loaded by flow medium pressure on the side remote from the valve seat (**42**), said valve sleeve (**44**) on the coupling of both the coupling halves meets by an end face onto a contact surface of the sleeve of the other coupling half receiving the valve cone, the spigot-like valve seat placing itself by its end face onto the valve cone and displaces said valve cone in direction of its opening setting, the improvement comprising: the sleeve (**29**) of the one coupling half (**10**) receiving the valve cone (**25**) being an annular piston (**27**) guided to be axially movable in the sleeve-like housing (**28**, **29**) of the one coupling half and the side of which remote from the valve seat surface (**30**) bears against a prestressed compression spring (**32**) and has a surface which is loadable by flow medium pressure and which is greater than the surface of the valve sleeve (**44**) loadable by flow medium pressure in the other coupling half, the rearward loading surfaces and spring supports of the valve sleeve (**44**) on the one hand and of the annular piston (**27**) with the valve cone (**25**) on the other hand being so matched to each other that, when the coupling half (**11**) with the valve sleeve (**44**) stands under pressure and the other coupling half (**10**) is free of pressure, the valve sleeve (**44**) and the valve cone (**25**) remain in closing position, but said valve cone being displaced axially together with the annular piston (**27**) receiving it, said annular piston however returning into its original position on a rearsided flow medium pressure loading of the valve cone and of the annular piston to be axially movable, while its seat surfaces (**30**) lifts off from the valve cone (**25**) and the valve sleeve (**44**) in the other coupling half (**11**) is simultaneously displaced into its opening setting while freeing a throughflow path, whereby the coupling half is free of pressure when the other coupling half is under high pressure, after coupling the two halves the closure pieces of both halves remaining in closed position through the coupling for as long as flow medium pressure acts on said one coupling half resulting in release of axial displacement of said annular piston whle said valve cone is stationary and the flow passages of both coupling halves become simultaneously opened.

4,429,714
CONTROL VALVE
Allan B. Hughes, Wilmington, Del., and Terrence A. Dear, Elkton, Md., assignors to E. I. Du Pont de Nemours & Co., Wilmington, Del.
Filed Aug. 3, 1981, Ser. No. 290,081
Int. Cl.³ F16K 47/14, 47/02
U.S. Cl. 137—625.3 4 Claims



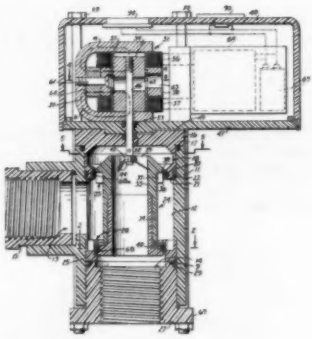
1. In a valve including a body with a passage therethrough, a seat in the passage and a plug movable toward and away from the seat, a cage surrounding the plug, said cage comprising: a stack of annular plates and an annular wire screen between each pair of adjacent plates, the plates having spaced legs projecting from one side adjacent the inner and outer edges thereof, each screen also being located between the inner and outer legs of one plate.

4,429,715
FLUID FLOW CONTROL VALVE
Derek J. Goldsmith, Sevenoaks, England, assignor to Goldsmith Patent Holdings (Sevenoaks) Limited, Westerham, England
Filed Apr. 5, 1982, Ser. No. 365,590
Claims priority, application European Pat. Off., Apr. 10, 1981, 81301592.2
Int. Cl.³ F16K 11/02
U.S. Cl. 137—625.17 21 Claims



13. A fluid flow control valve comprising a body defining a chamber therein and having two inlet ports and at least one outlet port communicating with said chamber therein; a control member axially movable within the chamber to open and close communication from the inlet ports to outlet and rotatable to control the relative rate of flow through the individual inlet ports; and fluid pressure responsive means operable by supply fluid pressure from at least one of the inlet ports for providing a servo action to assist axial movement of the control member from a position in which both inlet ports are in open communication with outlet to a position in which there is no communication from either inlet port to outlet, said fluid pressure responsive means defining a pressure chamber the fluid pressure in which is operable to urge the control member towards a fluid flow closing position and comprising one way valving means which provides for fluid communication from each of the inlets to said pressure chamber, said one way valving means comprising an annular cup seal permitting fluid flow therepast in one direction only.

4,429,716
CONTROL VALVE
Richard A. Conrad, 1422 Phillips St., Vista, Calif. 92083
Filed Feb. 1, 1982, Ser. No. 344,610
Int. Cl.³ F17D 1/00
U.S. Cl. 137—625.35 6 Claims



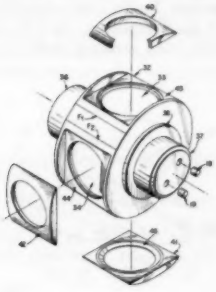
1. A valve comprising:
a valve body having a bore,
a fluid outlet passage opening into said bore adjacent one end of said bore,
a fluid inlet passage opening into said bore intermediate the ends of said bore,
a cylindrical valve element in said bore,
means forming a first annular valve seat in said bore and intermediate said inlet and said outlet passages,
said bore having a longitudinally grooved section adjacent said seat,
a first annular elastomeric seal carried by said valve element and slideable along said grooved section,
means on said valve element forming a second annular valve seat at the opposite end of said bore,
said valve element having a second longitudinally grooved section adjacent said second seat,
a second annular elastomeric seal carried by said valve body,
said second seal being slideable along said second grooved section,
said grooved sections and said seals forming the sole sliding support for said valve element, and
means for selectively moving said valve element in one direction to engage said seals with respective ones of said seats whereby to close said valve and moveable in the opposite direction to remove said seals from engagement with said respective seats whereby to open said valve.

4,429,717

VALVE FOR CONTROLLING THE FLOW OF SEMI-LIQUID COMPOSITIONS

Robert N. Montgomery, 3728 University Ave., Laurel, Miss. 39440

Filed Sep. 4, 1981, Ser. No. 299,539
Int. Cl.³ F16K 11/085, 5/08
U.S. Cl. 137—625.47 7 Claims



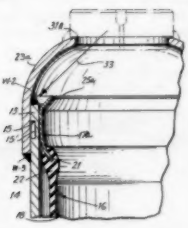
1. A valve for controlling the flow of a liquid stream containing solid materials, comprising a valve housing having at least two housing ports for fluid communication with said liquid stream, a cylindrical valve core journaled for rotation within said housing to provide fluid communication between said housing ports and having fluid passages formed therein, at least one of said fluid passages having cutting plate means disposed at the opening of said fluid passage for cutting solid materials during activation of the valve, and means for rotating said valve core to provide fluid communication between said housing ports and said fluid passages, said cutting plate means comprising a circular knife edge disposed along the outside edge of at least one of said fluid passages.

4,429,718

PRESSURE RESISTANT ACCUMULATOR DEVICE

Jacques H. Mercier, New York, N.Y., assignor to The Normand Trust, New York, N.Y.

Filed Jul. 26, 1982, Ser. No. 401,863
Int. Cl.³ F16L 55/04
U.S. Cl. 138—30 4 Claims



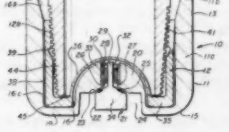
1. An accumulator device comprising a pressure vessel including a closed end having an oil port and an open end, said open end terminating in an upwardly directed edge portion, a bladder subassembly mounted in said open end, said sub-assembly including an axially elongated metallic mounting skirt having a bladder fixedly secured to one end thereof, said mounting skirt being disposed within said vessel with said one end nearest said closed end of said vessel, at least a portion of the outer wall portion of said skirt intimately engaging the inner wall portion of said vessel adjacent said open end, said skirt including an upper end portion extending above said open end of said vessel, a cap member having an opening for the reception of a gas charging valve, said cap member being positioned in closing relation of said open end, said cap member including a depending skirt outwardly lapping said open end, said cap member including a downwardly directed edge portion, said upper end portion of said skirt, edge portion of said vessel, and inner wall portion of said cap member together defining an annular trough, a first continuous annular weld connection formed between said mounting skirt and said vessel at engaging portions thereof, a second continuous annular weld connection received within said annular trough and connecting said edge portion and the inner wall portion of said cap member and a third continuous annular weld connection formed between said edge portion of said cap member and outer wall portion of said vessel.

4,429,719

PIPE THREAD PROTECTOR

Donald E. Mosing, P.O. Box 53909, Lafayette, La. 70505

Filed Aug. 5, 1982, Ser. No. 405,595
Int. Cl.³ B65D 59/06; F16L 21/02
U.S. Cl. 138—96 T 4 Claims



1. A pipe thread protector for protecting the threads of a pipe section, comprising:

(a) a first member having a first cavity;

(b) a second member slidably constrained within the first cavity between first and second positions, said second member including sealing means for providing sealing contact with said first cavity, said second member having a second cavity for reception of the pipe section therewithin when in said first position, said second member being shifted to said second position when the pipe section is fully inserted within the second cavity;

(c) gripping means formed on said second cavity for engaging the pipe threads when said second member is in said second position, said gripping means releasing said pipe threads when in said first position;

(d) locking means for maintaining said second member in said second position whereby said gripping means are retained in engagement with the pipe threads, said locking means being externally releasable for removing the pipe thread protector from the pipe section;

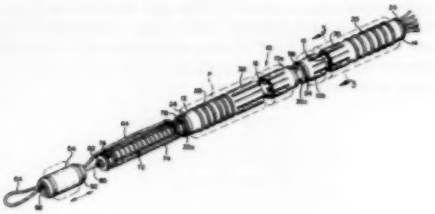
(e) said locking means comprises vacuum means for evacuation of air between said first and second members when said second member is shifted to said second position, whereby said second member is maintained in said second position, said vacuum means further enabling the readmission of air between said first and second members so as to enable said first member to shift to said first position for releasing said pipe thread protector from the pipe section.

4,429,720

APPARATUS FOR SEEKING OUT AND REPAIRING LEAKS IN PIPES

Richard D. Beck, P.O. Box 7247, and Campbell H. Steketee, Jr., 3421 25th St., S.E., both of Salem, Oreg. 97303

Filed Sep. 23, 1982, Ser. No. 421,904
Int. Cl.³ F16L *55/18*
U.S. Cl. 138—97 **10 Claims**



1. Apparatus for repairing leaks in a pipe comprising
(a) an elongated flexible body member arranged to be inserted in a pipe,
(b) said body member having leading and trailing end portions,
(c) said leading and trailing end portions being expandable,
(d) an expandable intermediate portion on said body member of a length to span a leak in a pipe,
(e) inflating means in said body member arranged to expand said leading and trailing end portions for sealing said ends against the interior surface of a pipe,
(f) said intermediate portion also being expandable by said inflating means,
(g) and grout carrying means in said body member for discharging grout along said intermediate portion and into a leak in a pipe,
(h) the exterior surface of said expandable intermediate portion having longitudinal passageways for the flow of the grout in the expanded condition of said intermediate portion.

8. Apparatus for repairing leaks in a pipe comprising
(a) an elongated flexible body member arranged to be inserted in a pipe,
(b) means in said body portion for supplying grout into a pipe for repairing a leak in the pipe,
(c) an expandable head adjacent the leading end of said body member,
(d) means flexibly connecting said head to said body member,
(e) inflating means in said head arranged to expand it against the interior surface of a pipe to obtain a grip on the pipe,
(f) and double acting fluid operated cylinder means connected between said body member and said head whereby upon selected inflation and deflation of said head and operation of said fluid operated cylinder means said body member is arranged to be pulled along a pipe.

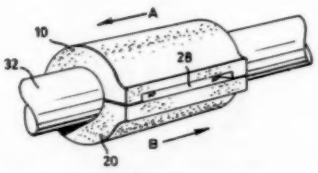
4,429,721

INTERLOCKING REFRACTORY SEGMENTS

Raymond W. Davis, Burlington, Canada, assignor to Plibrico (Canada) Limited, Burlington, Canada

Filed Nov. 15, 1982, Ser. No. 441,561
Claims priority, application Canada, Nov. 10, 1982, 415368
Int. Cl.³ F16L *9/22;* **F27D** *3/02*
U.S. Cl. 138—149 **1 Claim**

1. A refractory segment comprising:
(a) a body of refractory material having an inner face formed to provide a pipe receiving channel, an outer face spaced outwardly from said inner face, a pair of longitudinal side faces extending laterally, one on either side of said channel and an end face at each end of said body,
(b) a setback formed in at least one of said side faces, said setback being in the form of a recess which has an inner face spaced inwardly from its associated side face and each end face of the body to form an abutment between said inner face and each end face, each recess opening laterally outwardly through said outer face whereby the interior of each recess is visible from the exterior of the body,
(c) at least two anchor members embedded in said body, each anchor member having exposed end faces projecting one from each longitudinal side face of said body, said anchor members being arranged such that the exposed



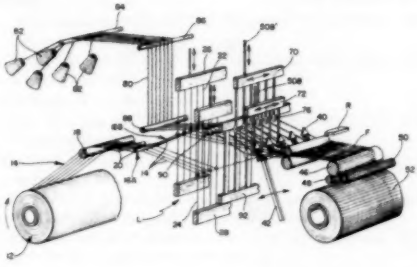
ends thereof project from each end face in which a setback is formed and are arranged to be disposed within the setback so as to be visible from the exterior of the body,
(d) the exposed ends of said anchor means being adapted to interlock with the exposed ends of the anchor means of another segment,
(e) said setback being proportioned to permit and said exposed ends being arranged to permit longitudinal relative movement between a pair of oppositely disposed segments to effect interlocking of the exposed ends when the segments are positioned about a pipe in use.

4,429,722

METHOD AND APPARATUS FOR WEAVING FABRICS OF NOVEL CONSTRUCTION

Earl E. Herzog, Greenville, R.I., assignor to Quaker Fabric Corp., Fall River, Mass.

Filed May 18, 1981, Ser. No. 264,534
Int. Cl.³ D03C *7/06*
U.S. Cl. 139—48 **30 Claims**



1. In a loom means for advancing a plurality of warp yarns in generally parallel paths through said loom for weaving into fabric, and means for deflecting said warp yarns in diverging planes during their advance to form a shedding zone through which filling yarn is projected for interweaving with said warp yarns during subsequent beat up by a reed to the fell of the fabric being woven on the loom, the improvement comprising: a plurality of decorating yarns advancing through the loom to the fabric in paths at least a portion of which are generally parallel to said warp yarns, harness means for engaging said

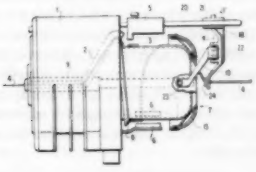
decorating yarns, and means for operating said harness means in a predetermined sequence to shift said decorating yarns controlled thereby from a first position residing generally parallel with said warp yarns to a second position where said decorating yarns are displaced laterally from said warp yarns, said operating means thereafter shifting said harness means in a direction to dispose said decorating yarns in a third position overlaying a preselected number of said warp yarns and thereafter projecting said decorating yarns to a fourth position within said shedding zone for binding into said fabric during beat up of said filling yarn, said harness means including at least first and second harnesses, each said harness being adapted to engage a predetermined group of said plurality of decorating yarns.

4,429,723

YARN BRAKING MEANS FOR YARN FEEDING DEVICES

Adriano Maroino, Gaglianico, Italy, assignor to Roj Electrotex S.p.A., Biella, Italy

Filed Oct. 15, 1981, Ser. No. 311,752
Claims priority, application Italy, Oct. 15, 1980, 25350 A/80
Int. Cl.³ D03D *47/36*
U.S. Cl. 139—452 **2 Claims**



1. Means for braking the yarn coming out of devices feeding said yarn to weaving machines with a constant adjustable tension, of the type acting on an end cap of a stationary winding drum of a said device, comprising a plurality of elastically yielding metal elements, positioned radially in a support that envelops said cap and is self-centering in respect of said cap, said elements engaging the outcoming yarn about a circumferential area of the cap having a slightly smaller diameter than that of the winding drum of the feeding device, said metal elements being substantially radial sheet-metal blades, arranged to form a frustoconical surface and mutually connected along the major circumference of said surface, said blades being mounted in an open cup-shaped support of plastic material, the peripheral connection area of said blades being anchored by means of an elastic deformable ring in an inner seat on the rim of wider diameter of said cup-shaped support, the free ends of said blades bearing on the rim of smaller diameter of the same cup-shaped support.

4,429,724

PRESSURE GENERATOR FOR INTRAVASCULAR DILATOR

Gerald Dorros, and Donald A. Spring, both of Milwaukee, Wis., assignors to Cardiovascular Diagnostic Services, Inc., Milwaukee, Wis.

Filed Oct. 20, 1980, Ser. No. 199,099
Int. Cl.³ A61M *29/02*
U.S. Cl. 141—27 **3 Claims**

1. Pressure generating means for pressurizing a liquid to be delivered at a controlled pressure to a catheter from a container of said liquid, said container including plunger means for expelling and recovering liquid relative to said container,

said pressure generator including:

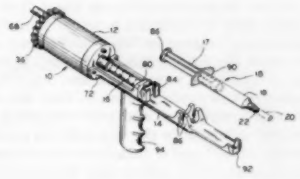
first means adapted to be coupled to said plunger,

second means constructed and arranged to be advanced and withdrawn at a controlled rate relative to said first means,

said second means including operating means and a first threaded member coupled to said first means and a second threaded member coupled to said operating means,

said first means comprising a third member slidably engageable with said first threaded member and being coupled to said plunger means,

elongate spring means disposed between said first threaded member and third member for resiliently advancing or retracting said third member relative to said plunger when said first member is rotated, whereby when one of said threaded members is rotated by said operating means in a first direction, said first member and said third member advance toward said container to pressurize the liquid



therein, whereby liquid is discharged at a controlled rate from said container to said catheter, and when the one of said threaded members is rotated by said operating means in an opposite direction, said first and third members are displaced away from said container to retract said plunger and withdraw liquid from said catheter and return the same to said container,

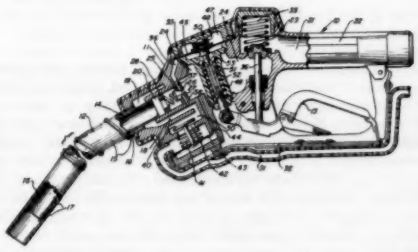
said first and third members each include hollow tubular portions in telescoping engagement, said spring means being disposed within said tubular portions, and retainer means coupled to said first and third members for preventing the separation thereof, said retainer means including elongate means extending axially through said tubular portions and being engageable at its opposite ends with said first and second members.

4,429,725

DISPENSING NOZZLE FOR VACUUM ASSIST VAPOR RECOVERY SYSTEM

Donald C. Walker, Munster, Ind., and Theodore O. Wagner, St. Charles, Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Dec. 30, 1981, Ser. No. 335,637
Int. Cl.³ B65B *3/18*
U.S. Cl. 141—59 **4 Claims**



1. A dispensing nozzle for use in a vacuum assist vapor recovery system, said nozzle comprising:

(a) a nozzle body having an inlet and an outlet for liquid to be dispensed;

(b) a filling spout attached to said nozzle body, said spout being adapted for loose fitting reception in a vehicle tank fill pipe and having an internal conduit for liquid connecting to said nozzle body outlet and an external conduit for vapor return surrounding the liquid conduit, said two conduits defining a passage for conducting vapor from the vehicle tank to a vapor return conduit means in said nozzle body;

(c) a control valve in said nozzle body for controlling the flow of liquid through said body from said inlet to said outlet;

(d) manually operated means for controlling the operation of said control valve and vacuum responsive release means to effect closing of said valve and stoppage of liquid flow when a predetermined partial vacuum is induced within said nozzle body;

(e) venturi means responsive to liquid flow, through said nozzle body for inducing a partial vacuum and an interconnecting passage between said vapor return conduit means to the venturi means, said passage normally allowing the flow of vapor from said vapor return conduit means to said venturi means to limit the partial vacuum induced thereby and said interconnecting passage being located at a point in the vapor return conduit which becomes full of liquid at such times when liquid begins to be aspirated from the vehicle tank through the vapor return conduit; and

(f) a check valve within the nozzle body for closing said vapor return conduit which valve is actuated to an open position by liquid pressure within the nozzles body when said control valve in the nozzle body is open.

4,429,726

MACHINE FOR CARRYING OUT MILLING, PLANING, AND SIMILAR OPERATIONS

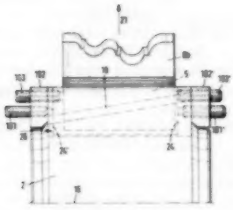
Otto Betzler, Tauberbischofsheim, Fed. Rep. of Germany, assignor to Michael Weinig GmbH & Co. KG, Tauberbischofsheim, Fed. Rep. of Germany

Filed Aug. 6, 1981, Ser. No. 290,492

Claims priority, application Fed. Rep. of Germany, Aug. 9, 1980, 3030206

Int. Cl.³ B27C 5/00

U.S. Cl. 144—134 R **6 Claims**



1. In a machine for carrying out milling, planing, and similar operations of workpieces composed of wood, plastic and similar synthetic materials, said machine including at least two drive spindles, each of which carries a circular cutter head (2) rotatable about a carrier axis (16) and having radially spaced groove-shaped receptacles (3) on the peripheral surface for supporting cutter blades (6) therein, the combination therewith of means for adjustably supporting said cutter blades (6) in each of said groove-shaped receptacles with their outer cutting surfaces accurately positioned along a cutting circle diameter (11), said adjustable blade supporting means comprising an adjusting plate (5) supported along one wall (9) of said groove-shaped receptacle (3), said adjusting plate (5) including a key-type guide (17) extending at an inclined angle and outwardly from a front side (13) of said adjusting plate (5) adjacent said wall (9) of said groove-shaped receptacle (3), an inclined groove (18) extending along said wall (9) and slidably receiving said key-type guide (17) therein, said inclined key-type guide (17) and said inclined groove (18) providing minor inward and outward radially directed adjustment of said adjusting plate with transverse movement of said adjusting plate (5) from side to side of said groove-shaped receptacle (3), a cutter blade (6) supported against a rear side (12) of said adjusting plate (5) and including sawtoothlike grooves (15) on one side, sawtoothlike grooves (14) on said rear side (12) of said adjusting plate (15) and mating with said sawtoothlike grooves (15) on said cutter blade (6), said sawtoothlike grooves (14, 15) extending parallel to said carrier axis (16) and permitting major inward and outward adjustments of said cutter blade (6) relative to said adjustable plate (5), said inclined angle of said key-type guide (17) defining an acute angle relative to said sawtoothlike grooves (14, 15), first setting means (101, 101') supported on opposite end portions of said cutter head carrier (2) and being engageable with opposite end portions of said adjusting plate (5) for imparting side to side movement to said adjusting plate (5) and to thereby provide minor inward and outward adjustments of said adjusting plate (5) and said cutter blade (6) relative to said cutting circle diameter (11), second setting means (103, 103') supported on opposite end portions of said cutter head carrier (2) and being engageable with opposite end portions of said cutter blade (6) for permitting side to side adjustment of the cutter blade (6), whereby when said second setting means (103, 103') axially fixes said cutter blade (6), adjustment of said adjusting plate (5) relative to the cutter blade (6) restricts movement of the cutter blade (6) to the radial direction only and locking means (7) carried by said groove-shaped receptacle (3) for maintaining said adjusting plate (5) and said cutter blade (6) in adjusted position in said groove-shaped receptacle (3).

4,429,727

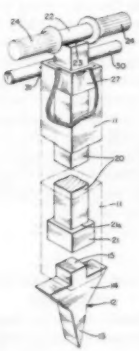
LOG SPLITTER

Robert C. Wilson, 1105 N. Stephenson Hwy., Apt. 74, Royal Oak, Mich. 48067

Filed Apr. 21, 1982, Ser. No. 370,365

Int. Cl.³ B27L 7/00

U.S. Cl. 144—193 C **1 Claim**



1. A log splitter comprising:

a vertically arranged, elongated, generally square cross-section tube and a similarly cross-sectional shaped rod fitted within and telescopically slidably arranged within the tube and extending out of the upper end of the tube;

first handle means formed on the upper end of the rod for manually supporting and handling the log splitter including an elongated rod-like member secured at its center to

the upper end of the rod with hand grips formed on opposite sides of the rod axis;

an enlarged hammer block portion formed upon the lower end portion of the rod;

a pointed wedge tip member secured upon the lower end of the tube and having an anvil block portion arranged within the lower end of the tube and extending a short distance upwardly within the tube for receiving axially downwardly directed impacts from said hammer block portion;

said rod slidably extending through a guide and stop bushing secured within the upper end of the tube, with the bushing being coaxially arranged relative to the axes of the tube and rod and having a cross-sectionally shaped opening corresponding to the cross-sectional shape of the rod, and with said bushing preventing rotation of the rod within the tube and forming a stop for limiting the upward movement of the rod when the bushing is contacted by the hammer block portion;

secondary handle means secured upon the upper end of the tube closely adjacent to said elongated member of said first handle means when the rod is maximally retracted within the tube for permitting simultaneous manual gripping of the hand grips and secondary handle means for temporarily securing the rod and tube together against relative telescopic movement, and said secondary handle means comprising an elongated shaft arranged below and parallel to said hand grips so that the shaft and adjacent hand grips may be manually grasped together for manually locking the rod relative to the tube; and

said wedge tip member being formed in two integral sections, namely, a lower, narrow, elongated, sharp pointed section and an upper, wide, roughly V-shaped section whose edges diverge at a relatively wide angle as compared with the divergence of the edges of the lower section with which the upper section is integral, for first penetrating into a log and then widening the split formed in the log;

whereby the tip member on the lower end of the tube pierces and splits a log section when the tip is rested upon the log section and the rod is manually raised and then rapidly lowered so that the hammer block portion impacts the anvil block portion.

4,429,728

TIRE HAVING AN ASYMMETRICAL TREAD PROFILE

Jakob Ippen, Leverkusen, and Friedel Stüttgen, Pulheim, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany

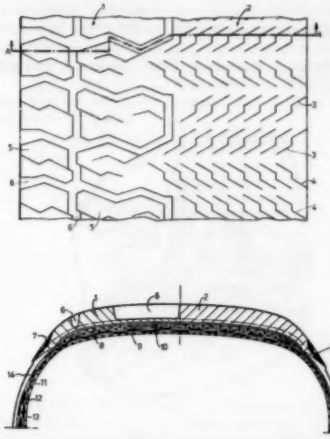
Filed Jul. 26, 1982, Ser. No. 401,570

Claims priority, application Fed. Rep. of Germany, Aug. 1, 1981, 3130574

Int. Cl.³ B60C *11/00, 11/04, 11/12*

U.S. Cl. 152—209 A **4 Claims**

1. A tire having an asymmetrical tread profile, characterised in that, looking in the running direction, the treads of both halves of the tire have different profiles and consist of different rubbers specifically adapted to the particular tread profile, one half of the tire having a mixed profile suitable for wet or dry summer and winter conditions and consisting of interlocked profile blocks separated by grooves extending in and transversely of the running direction and the other half of the tire having a continuous profile interrupted only by lamellae which is suitable for snow and ice and of which the lamellae are arranged at an angle of 15° to 45° to the running direction and



gauged in such a way that from 50 to 100 lamellae have contact with the ground.

4,429,729

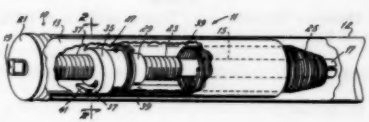
WINDOW SHADE CLUTCH ASSEMBLY

Randy Winslow, Ripley, Tenn., assignor to Clopay Corporation, Cincinnati, Ohio

Filed Jul. 9, 1982, Ser. No. 396,649

Int. Cl.³ E06B *9/20*

U.S. Cl. 160—315 **26 Claims**



1. An assembly for preventing over tensioning of a spring motor means in a window shade comprising:

stationary means connected to said spring motor means;

rotation means rotatable in a first and second direction relative to said stationary means, said rotation means being connected to said spring motor means, said spring motor means being tensioned with the rotation of said rotation means in said first direction; and

means for preventing further tensioning of said spring motor means at a selected tension thereof while permitting said rotation means to continue to rotate in said first direction.

4,429,730

CARGO CONTAINER COVER

Ronald W. Elston, Burnham, England, assignor to Transequip Limited, Feltham, England

Filed Jan. 22, 1982, Ser. No. 341,763

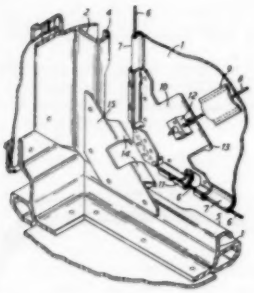
Claims priority, application United Kingdom, Jan. 28, 1981, 8102618

Int. Cl.³ A47H *3/00*

U.S. Cl. 160—368 R **4 Claims**

1. A cover for an opening in a cargo container, the cover comprising a flexible curtain secured at the top of the opening to the container, wherein the curtain has at its sides and lower portion peripheral tunnels accommodating at least one periph-

eral strand, and at its back inclined tunnels accommodating at least two bracing strands, the curtain including at its lower portion spaced apart fittings including each guiding and attachment means for the strands, over-centre clip means for simultaneously pulling taut said one peripheral strand and said at least two bracing strands during relative pivoting movement of first and second parts of said over-centre clip means, said over-centre clip means being an over-centre clip having first and second parts, said second part being attached to the container adjacent the opening, and said first part being connected to said one peripheral strand and said at least two bracing strands whereby upon movement of said first part from a nonover-centre position relative to said second part to an over-centre position of said first part relative to said second part, said peripheral and bracing strands are drawn taut.

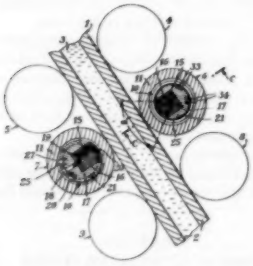


4,429,731

TRANSLATING FIELD INDUCTOR FOR PRODUCING A DIRECTIONALLY ORIENTED FLUX WITHIN THE STIRRING ROLLER OF A CONTINUOUS CASTER FOR SLABS

Jean Delassus, Montmorency, France, assignor to CEM Compagnie Electro-Mecanique, Paris, France

Filed Nov. 23, 1981, Ser. No. 324,099
Claims priority, application France, Nov. 25, 1980, 80 24960
Int. Cl.³ B22D *27/02*
U.S. Cl. 164—504 **3 Claims**



1. An inductor for generating a linearly translating magnetic field from within a stirring roller of a continuous slab casting apparatus, comprising:

a stationary arbor disposed within the stirring roller, said arbor being made of a nonmagnetic metal having good electrical conductivity, and including a single longitudinal groove having a wide transverse cross-section relative to the diameter of said arbor;

a magnetic core comprising a plurality of flat magnetic sheets disposed parallel to the axis of said arbor within said wide groove such that the arbor effectively forms a screen surrounding three sides of said core;

a series of circumferential grooves forming notches in said arbor and said core and being spaced over the length of said arbor; and

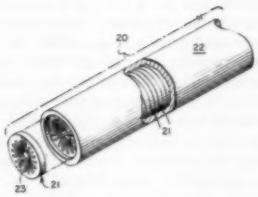
a plurality of circular induction coils respectively housed in said circumferential grooves.

4,429,732

REGENERATOR STRUCTURE FOR STIRLING-CYCLE, RECIPROCATING THERMAL MACHINES

William M. Moscrip, Rte. 2, Box 474, Fredericksburg, Va. 22405

PCT No. PCT/US82/00650, § 371 Date Jul. 28, 1982, § 102(e) Date Jul. 28, 1982, PCT Pub. No. WO82/04100, PCT Pub. Date Nov. 25, 1982
PCT Filed May 14, 1982, Ser. No. 403,772
Int. Cl.³ F28D *17/00*
U.S. Cl. 165—10 **4 Claims**



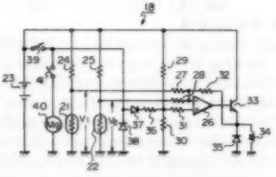
1. A regenerator structure for use in a Stirling-cycle, reciprocating, thermal machine comprising a gas-tight shell providing a conduit for machine working fluid, a thermal mass packing said shell comprised of wafers of solid material with tops and bottoms lying in parallel planes, stacked and perforated and having an outer periphery shaped to conform to the transverse sectional configuration of the interior of said shell, the perforations through said wafers being arranged to provide one or more passages through said packing, each having a high ratio of exposed surface area to cross-sectional flow area and said wafers being composed of material having anisotropic properties disposed to provide a high ratio of the thermal conductivity normal to the direction of the flow through said passage to the thermal conductivity in the direction of that flow.

4,429,733

APPARATUS FOR CONTROLLING BLOWING MODE OF A CAR AIR-CONDITIONER

Toshizo Hara, Kawashima; Shinji Sutoh, Annaka, and Toshio Kojima, Kounan, all of Japan, assignors to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Mar. 30, 1981, Ser. No. 248,834
Claims priority, application Japan, Mar. 31, 1980, 55-40231
Int. Cl.³ B60H *1/00*; F24F *7/00*
U.S. Cl. 165—16 **9 Claims**



1. An apparatus for controlling the blowing mode of air from

a car air-conditioner for vehicles, said air-conditioner having a duct in which a blower, an evaporator and a heater core are mounted, comprising:

means for changing the blowing mode of the air from the air-conditioner, said changing means having an upper vent and a lower vent which are formed at the outlet portion of said duct and a shutter for changing the ratio of the quantity of air issuing from said upper vent to the quantity of air issuing from said lower vent;

means for generating a control signal depending upon at least the temperature of the air outside of the vehicle, said generating means including a sensor for producing an output signal indicative of the temperature of the air outside of the vehicle, and a circuit for shifting the level of the output signal in response to the operating mode of the air-conditioner; and

means responsive to the control signal for driving said shutter so as to be positioned at any desired position in a continuous positional manner while avoiding discrete steps in the change of position.

4,429,734

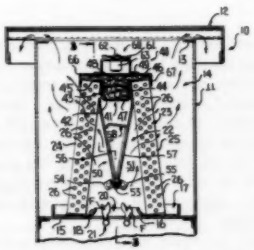
HEAT EXCHANGER COIL

Gerry Vandervaart, Niagara Falls, Canada, assignor to Kool-Fire Limited, Niagara Falls, Canada

Filed May 4, 1981, Ser. No. 259,946

Int. Cl.³ F28F *29/00*

U.S. Cl. 165—29 **17 Claims**



1. In a heat pump, an outdoor heat exchanger, said outdoor heat exchanger comprising coil means for conducting therethrough a heat exchange medium, said coil means defining a substantially enclosed interior chamber into and upwardly through which air is adapted to flow, said coil means including relatively spaced coil portions between which air passes from said interior chamber to the exterior thereof, said coil means having a generally open lower end portion in fluid communication with said interior chamber, heat-generating means disposed generally contiguous and below said coil means for introducing a flame substantially entirely into said interior chamber through said open lower end portion whereby the heat of the flame is absorbed by the heat exchange medium during the passage of the heat into the interior chamber and through the spaced coil portions, means for closing an upper end portion of said interior chamber to prevent heat from flowing therethrough whereby essentially all of the heat introduced into the interior chamber is absorbed during its passage therethrough and to the exterior of said coil means through said spaced coil portions, and fan means for drawing a limited amount of air from the exterior of said coil means to withdraw air from said interior chamber thereby creating a negative pressure within said interior chamber for assuring air flow from said interior chamber to the exterior thereof through said spaced coil portions.

4,429,735

SIMPLIFIED AIR CONDITIONER

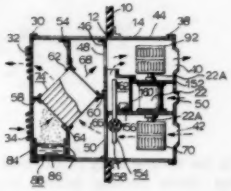
Tamotsu Nomaguchi; Masahiro Tano, both of Amagasaki; Mitsuo Fukuda, and Tatsuo Saitou, both of Nakatsugawa, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 90,309, Nov. 1, 1979, abandoned. This application Sep. 15, 1981, Ser. No. 302,359

Claims priority, application Japan, Nov. 7, 1978, 53-137093; Mar. 13, 1979, 54-29161

Int. Cl.³ F23L *15/02*; F24F *3/14*

U.S. Cl. 165—60 **1 Claim**



1. A simplified air condition, comprising: a box member including at least one suction portion on each of the indoor and outdoor sides thereof, and at least one exhaust port disposed on each of the indoor and outdoor sides thereof, a suction passageway and an exhaust passageway extending through said box member between the respective suction and exhaust ports, said passageways crossing each other between said suction and said exhaust ports; a suction air blower disposed in said suction passageway to draw the outdoor air through said suction passageway; an exhaust air blower disposed in said exhaust passageway to exhaust the indoor air through said exhaust passageway; a heat exchanger disposed in said passageways at the crossing of said suction and exhaust passageways to effect heat exchange between the outdoor air and the indoor air; a humidifier disposed in said exhaust passageway and between said suction port on the indoor side and said heat exchanger to humidify and cool the exhausted indoor air; and a dehumidifier device disposed in said suction passageway between said suction blower and said heat exchanger to dehumidify the outdoor air, said dehumidifying device having a rotary dehumidification disc and driving means for rotating said rotary dehumidification disc, substantially half of said dehumidification disc extending transversely of said suction passageway to dehumidify the outdoor air, a reclaiming air passageway extending into said box member from the outdoor side of said box member to said exhaust passageway upstream of said exhaust air blower, the other half of said rotary dehumidification disc outside of said suction passageway extending transversely into said reclaiming air passageway; and a heater means disposed in said reclaiming air passageway upstream of said other half of the rotary dehumidification disc for heating outdoor air sucked through said reclaiming air passageway.

4,429,736

CONCENTRATION IN TIME OF A GAS COMPONENT ENTRAINED IN A CARRIER GAS

Andrew J. Turner, Great Missenden, England, assignor to Perkin-Elmer Limited, Buckinghamshire, England

Filed Sep. 24, 1981, Ser. No. 305,297

Claims priority, application United Kingdom, Oct. 10, 1980, 8032745

Int. Cl.³ F28B *21/00*

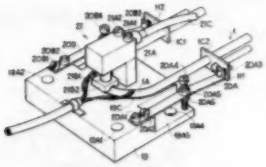
U.S. Cl. 165—61 **29 Claims**

1. A method of increasing the concentration in time of a gas component entrained in a carrier gas with which it forms a mixture, comprising the steps of:

(a) interposing between a solid phase temperature depressing means and an electrically conductive hollow body of low thermal capacity a thermal coupling means comprising a

material having a thermal conductivity much lower than that of the hollow body and prearranging the thermal resistance actually offered by the material to hold the hollow body at a given depressed temperature while the mixture is streamed through the hollow body;

(b) maintaining the stream for a predetermined condensation time to condense the gas component within the hollow body;



(c) raising the hollow body to an elevated temperature by applying ohmic heating thereto through a step-down transformer operating at a frequency of at least one kilohertz; and

(d) maintaining the elevated temperature for a predetermined thermal desorption time that is short compared with said condensation time to desorb the condensed gas component.

4,429,737

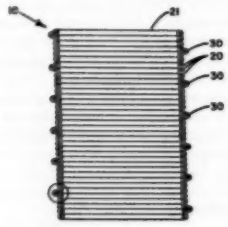
WRAPPED FIN HEAT EXCHANGER

John R. McManus, Marcellus, and Dale Jackson, Clay, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Nov. 12, 1981, Ser. No. 320,380

Int. Cl.³ F24B *1/06*

U.S. Cl. 165—125 **7 Claims**



1. A wrapped fin heat exchanger made from a single length of wrapped fin tubing including a tubular fluid conducting portion and fin material wrapped about the tubular portion to promote heat transfer to a gas flowing thereover which comprises:

a core portion of tubing formed in a generally cylindrical configuration having a plurality of helical loops of wrapped fin tubing, each loop being located a predetermined distance from the adjacent loop; and

a locking portion of tubing formed in a generally cylindrical configuration having a diameter different from the diameter of the core portion and having at least one helical band extending between opposite ends of the heat exchanger to secure the loops of the core portion in the cylindrical configuration as formed.

4,429,738

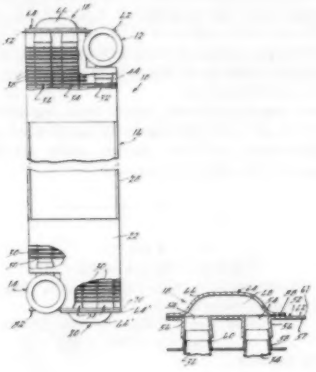
HEAT EXCHANGER CONSTRUCTION

Ivan D. Woodhull, Jr., Flat Rock, Mich., assignor to Karmazin Products Corporation, Wyandotte, Mich.

Continuation of Ser. No. 6,678, Jan. 26, 1979, abandoned. This application Aug. 10, 1981, Ser. No. 291,470

Int. Cl.³ F28D *1/04*

U.S. Cl. 165—151 **6 Claims**



1. In a heat exchanger of the type comprising a heat exchanging core assembly having a plurality of fluid conducting conduit members surrounded by heat radiating fins, an inlet header connected to one end of each of a first group of said conduit members, an outlet header connected to one end of each of a second group of said conduit members and means interconnecting the other ends of said first group of conduit members with the other ends of said second group of conduit members, the improvement wherein said interconnecting means comprises:

a base member overlying end portions of said conduit members, said base member having a plurality of openings defined by tapered tubular projections extending outwardly on one side of said base member, each of said projections being secured in fluid conducting telescopic relationship with one of said other ends of said fluid conduit members, said projections each having a taper which prevents telescopic movement of said one of said other ends beyond a plane defined by said base member;

an elongated cover member having a plurality of transversely extending raised spaced embossments, each of said raised embossments being positioned so as to overlie and extend between at least first and second ones of said plurality of openings whereby said raised portion and said base member define a fluid passageway interconnecting said one of said other ends of said first group with said one of said other ends of said second group of fluid conduit members;

a plurality of spot welds spaced between and adjacent opposite ends of said embossments for retaining said cover member directly to another side of said base member at a plurality of spaced locations intermediate each of said plurality of embossments; and

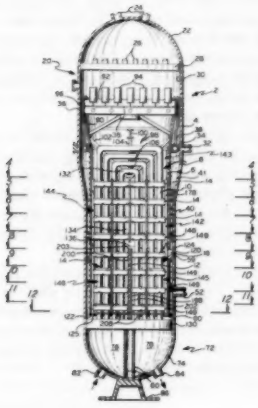
sealing means further securing said base member and said cover member subsequent to application of said spot welds, said sealing means also securing each of said one of said other ends within respective of said tubular projections whereby said sealing means may operate to create a substantially fluid tight sealing relationship therebetween.

4,429,739

HEAT EXCHANGER

Cecil C. Gentry, and William M. Small, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 29, 1980, Ser. No. 182,741
Int. Cl.³ F28F 9/00, 9/24
U.S. Cl. 165—159 4 Claims



1. Apparatus comprising:

(a) a first rod baffle comprising a first outer arc-shaped member having an arc of about 150° to about 180°, and a first end and a second end; a plurality of rods affixed to the first outer arc-shaped member as chords and a first arc-closure member affixed to the first end of the outer arc-shaped member and the second end of the outer arc-shaped member;

(b) a second rod baffle comprising a second outer arc-shaped member having an arc of about 150° to about 180°, a first end and a second end, a second arc-closure member affixed to the first end of the second outer arc-shaped member and the second end of the second outer arc-shaped member, and a second plurality of parallel rods each rod of the second plurality of parallel rods affixed by one end to the second outer arc-shaped member and by the other end to the arc-closure member;

and

(c) at least one support member affixed to each of the first arc-closure member and the second arc-closure member so as to retain the outer arc-shaped member and the arc-closure member of the first rod baffle in juxtaposed relationship with the outer arc-shaped member and the arc-closure member of the second rod baffle;

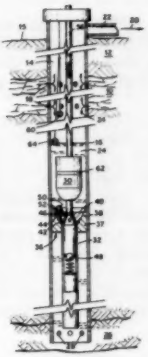
wherein each of the first arc-closure member and the second arc-closure member comprises an inner arc-shaped member in juxtaposed relationship with the outer arc-shaped member and having a first end and a second end and a first elongate member extending between the first end of the inner arc-shaped member and the first end of the outer arc-shaped member and a second elongate member extending between the second end of the inner arc-shaped member and the second end of the outer arc-shaped member and wherein the at least one support member comprises a U-shaped bracket with each of the first baffle and the second baffle affixed to the outside edge of one of the legs of the U-shaped bracket.

4,429,740

COMBINATION GAS PRODUCING AND WASTE-WATER DISPOSAL WELL

Raymond M. Malinchak, McKeesport, Pa., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Sep. 3, 1981, Ser. No. 299,232
Int. Cl.³ E21B 41/00
U.S. Cl. 166—53 8 Claims



1. A waste-water disposal system for use in a gas recovery well penetrating a subterranean gas-bearing earth formation wherein water discharges along with the gas from the gas-bearing earth formation and wherein the water is displaced from the well into a further earth formation underlying the gas-bearing earth formation and characterized by sufficient permeability for receiving said water, comprising:

a bore hole extending from the surface through the gas-bearing earth formation to said further earth formation;

a casing in said bore hole;

perforations projecting through said casing at locations contiguous to said gas-bearing earth formation;

pump means disposed in said casing intermediate said gas-bearing earth formation and said further earth formation;

conduit means coupled to said pump means for conveying water therefrom towards said further earth formation;

barrier means disposed in said casing at a location contiguous to and intermediate opposite ends of said conduit means for inhibiting the flow of water through said casing except through said conduit means;

valve means in said conduit means providing for the flow of water therethrough toward said further earth formation;

further conduit means in registry with the interior of the first-mentioned conduit means and the interior of said casing at a location above said barrier means for conveying water from said casing into the first-mentioned conduit means and thereby bypassing said pump means; and

valve means disposed in said further conduit means for providing flow of water therethrough towards the first-mentioned conduit means.

4,429,741

SELF POWERED DOWNHOLE TOOL ANCHOR

Craig R. Hyland, Magna, Utah, assignor to Christensen, Inc., Salt Lake City, Utah

Filed Oct. 13, 1981, Ser. No. 310,571
Int. Cl.³ E21B 23/04
U.S. Cl. 166—63 10 Claims

1. A self powered downhole tool anchor device preattached to a downhole tool adapted for attachment to support means for simultaneously lowering them as a unit in a single trip into a well bore and actuated by engagement with and weight

thereof applied toward a bottom of or plug in the well bore for attachment to a sidewall inthe well bore comprising:

an inner mandrel having

a closed end portionj with coupling means thereon connected to the downhole tool.

a sidewall extending around an internal chamber closed off by the closed end portion and extending axially to an opposite open end of the inner mandrel,

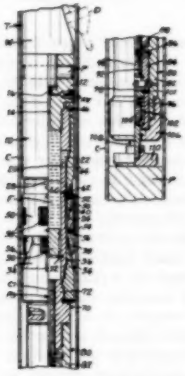
at least one fluid passage in the sidewall of the inner mandrel.

ratchet teeth on an intermediate external side portion of the sidewall of the inner mandrel, and a lower expander cone tapering outwardly and downwardly from and extending around a lower end portion of the inner mandrel;

an outer mandrel and piston extending around and adapted for sliding sealing engagement with an external surface of the inner mandrel and initially connected by shearable means to the inner mandrel and including

an internal piston surface area extending around the inner mandrel adjacent the fluid passage, and an upper cone situated adjacent a lower end portion of the outer mandrel and tapering inwardly toward and extending around the sidewall of the inner mandrel;

a plurality of gripping slips including upper and lower internal surfaces angularly spaced around the cones and fixed



against rotation relative to at least one of the cones and adapted for engagement and radial displacement by the cones into gripping engagement with the sidewall in the well bore; releasable slip housing means extending around and attached by shearable means to the upper cone portion of the outer mandrel and piston for displacing and maintaining the slips angularly spaced about for contact with the upper and lower cones;

ratchet means including ratchet teeth adapted for locking engagement in one direction with external teeth of the inner mandrel and displaceable in one axial direction by movement of the outer mandrel and piston relative to the inner mandrel for preventing opposite reverse movement and disengagement of the cones from the slips and slips from the sidewall;

power supply means supported adjacent the lower open end of the inner mandrel including combustible material adapted to be ignited by a primer igniter and supply a sufficient source of fluid pressure in the internal chamber for releasing and displacing the outer mandrel and piston, upper cone and slips relative to the inner mandrel and lower cone and force the gripping slips radially outwardly into gripping engagement with the sidewall in the well bore comprising

a power supply housing attached to the lower cone portion of the inner mandrel adjacent the open end including

an internal cartridge chamber extending between opposite ends of the housing,

a cartridge of ignitable combustible propellant material situated in the internal cartridge chamber with one end adjacent the open end of the inner mandrel including

a head at an opposite end of the cartridge, and

a central primer igniter capsule inserted into a central bore in the head for impaction and ignition by and upon release of preloaded firing means;

preloaded mechanical firing means supported adjacent to the power supply means for striking the primer igniter and igniting the combustible material including

an outer firing means housing attached to one end portion of the power supply housing,

firing pin means including a movable firing pin situated within the firing means housing and adjacent the head for striking the primer igniter capsule, and

releasable preloaded hammer means situated within the firing means housing and adjacent the firing pin means for impacting and propelling the firing pin into the primer igniter capsule; and

mechanical trigger means adjacent to the firing means and adapted for engaging a bottom or plug in the bore hole and to release the preloaded firing means when a sufficient predetermined amount of weight of the anchor device and support means is released and applied to the trigger means supported by the bottom or plug.

4,429,742

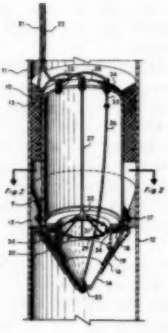
TUBULAR ALIGNMENT ASSEMBLY

Ronald E. Antes, Rickmansworth, England, assignor to Marathon Oil Company, Findlay, Ohio

Continuation-in-part of Ser. No. 64,144, Aug. 6, 1979. This application Jun. 4, 1981, Ser. No. 270,683

Int. Cl.[3] **E21B** *19/16*

U.S. Cl. 166—127 **3 Claims**



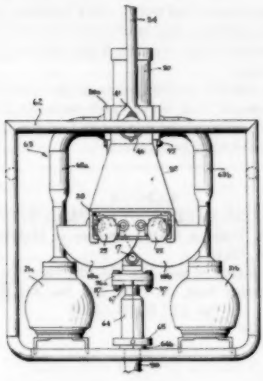
1. A tubular alignment assembly comprising an elongated stabbing means adapted to assist alignment of first and second hollow tubular members being positioned end to end, said tubular alignment assembly shaped to conform to the interior of the tubular members to be aligned and having a base portion flexibly attached to the end portion of the first tubular member and having a stabbing tip protruding beyond the end portion and shaped to engage and align said first tubular member with the second tubular member when the ends of the first and second tubular members are positioned end to end, wherein the tubular alignment assembly has a latching means in the stabbing tip adapted to lock the first tubular member into the second tubular member when said members are positioned end to end.

4,429,743

WELL SERVICING SYSTEM EMPLOYING SONIC ENERGY TRANSMITTED DOWN THE PIPE STRING

Albert G. Bodine, 7877 Woodley Ave., Van Nuys, Calif. 91406

Filed Feb. 1, 1982, Ser. No. 344,626
Int. Cl.³ E21B *37/08, 41/00*
U.S. Cl. 166—177 8 Claims



1. A well servicing system for generating and feeding sonic energy down a pipe string suspended in a bore hole to a down hole work area comprising:

orbiting mass oscillator means for generating sonic energy,

means for supporting said pipe string from a position above said bore hole,

cylinder-piston assembly means for resiliently connecting the supporting means to the top end of the pipe string,

means for providing pressurized fluid in said cylinder-piston assembly such that the fluid provides compliant loading for said piston, and

means for coupling said oscillator to said pipe string at a point therealong proximate to and below said cylinder-piston assembly means to transmit said sonic energy from said oscillator to said pipe string such that a low acoustical impedance is presented to said energy transmission.

4,429,744

OIL RECOVERY METHOD

Evin L. Cook, Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 261,824, May 8, 1981, abandoned. This application Sep. 23, 1982, Ser. No. 422,128
Int. Cl.³ E21B *43/24*
U.S. Cl. 166—263 5 Claims

1. In a method for recovering viscous oil from an oil-bearing subterranean reservoir penetrated by an injection well and a production well, the method comprising

(a) injecting a thermal recovery fluid comprising a mixture of steam and a hydrocarbon having from 3 to 8 carbon atoms in the molecule and mixtures thereof via said injection well into the reservoir to reduce the viscosity of the oil in the reservoir and to displace the oil toward said production well;

(b) recovering oil from said production well;

(c) throttling said production well and continuing injection of said mixture of steam and hydrocarbon without interrupting the injection rate until the bottom-hole pressure of said production well has increased to a desired pressure level; and

(d) opening said production well and continuing injection of said mixture of steam and hydrocarbon without interrupting the injection rate and recovering oil therefrom as the bottom-hole pressure of said well declines.

4,429,745

OIL RECOVERY METHOD

Evin L. Cook, Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 261,824, May 8, 1981, abandoned. This application Sep. 23, 1982, Ser. No. 422,130
Int. Cl.³ E21B *43/24*
U.S. Cl. 166—263 5 Claims

1. In a method for recovering viscous oil from an oil-bearing subterranean reservoir penetrated by an injection well and a production well, the method comprising:

(a) injecting a thermal recovery fluid comprising a mixture of steam and carbon dioxide via said injection well into said reservoir to reduce the viscosity of the oil in the reservoir and to displace the oil toward said production well;

(b) recovering oil from said production well;

(c) throttling said production well and continuing injection of said mixture of steam and carbon dioxide without interrupting the injection rate until the bottom-hole pressure of said production well has increased to a desired pressure level; and

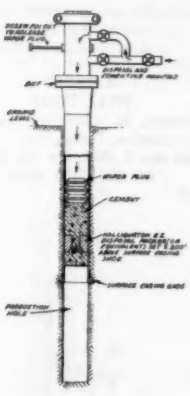
(d) opening said production well and recovering oil therefrom as the bottom-hole pressure of said well declines without interrupting the injection rate of the thermal recovery fluid.

4,429,746

METHOD AND APPARATUS FOR DISPOSING OF DRILLING MUDS AND WASTES GENERATED DURING WELL DRILLING OPERATIONS AND FOR PLUGGING AND ABANDONING THE WELL

Gerald D. Allard, 1904 Harbour Dr., Seabrook, Tex. 77586

Filed Jul. 29, 1981, Ser. No. 288,214
Int. Cl.³ E21B *23/00, 33/05, 33/13*
U.S. Cl. 166—291 6 Claims



1. A method for restoring the location of a drilling well operation by directing muds and waste fluids generated during the drilling operation and temporarily stored on the drill site, whereby the muds and waste fluids are pumped into the surface casing of the well after the drilling rig has been released from the well, the method comprising

coupling the surface casing at about ground level with a rubber wiper plug container which has the same or approximately the same inside diameter as the inside diameter of the surface casing prior to or after releasing said drilling rig;

wherein said rubber wiper plug container contains at least one rubber wiper plug and means to temporarily secure said rubber wiper plug inside the container

wherein said rubber wiper plug is sized to conform to the inside of the surface casing;

wherein said rubber wiper plug container is provided with at least one inlet,

wherein said inlet is in communication with the inside of said rubber wiper plug container at a position below the position of said rubber wiper plug;

injecting into said inlet at a position below said wiper plug, said muds and waste fluids and then injecting a slurry of cement through said inlet in an amount sufficient to plug said well; then releasing the rubber wiper plug and inserting fluid over the wiper plug into the surface casing to push the slurry of cement down through the inside of said casing; and removing said rubber wiper plug container from the surface casing.

5. A system for disposing of muds and fluids, generated during well drilling operation, comprising:

a surface casing of said well;

a means for allowing fluids to be pumped through it and for preventing fluids from coming up the well, said means disposed down said surface casing and secured in position;

an apparatus coupled to the surface casing at about ground level, said apparatus comprising:

a first means for holding a rubber wiper plug, the inside of said first means being cylindrical and having approximately the same diameter as the cylinder defined by the inside walls of said surface casing;

a rubber wiper plug sized to conform to the inside of said surface casing;

means for temporarily securing the rubber wiper plug in said first means;

at least two inlets communicating with the inside of said first means, one of said two inlets communicating with the inside of said first means below the position of the rubber wiper plug secured in said first means; and

coupling means including a flange for coupling said first means to the surface casing thereby allowing for release of the drilling rig from the well during the disposal.

4,429,747

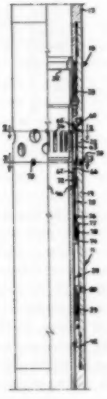
WELL TOOL

Jimmie R. Williamson, Jr., Carrollton, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Filed Sep. 1, 1981, Ser. No. 298,482

Int. Cl.³ E21B *34/08*

U.S. Cl. 166—321 **9 Claims**



1. A well tool, comprising:

a. an elongate tubular body having means on its opposite ends for attachment to a well flow conductor and having lateral port means intermediate its ends fluidly communicating its interior with the exterior thereof;

b. first sleeve valve means in said tubular body slidable between positions opening and closing said lateral port means;

c. second sleeve valve means in said tubular body surrounding said first sleeve means and initially closing said lateral port means, said second sleeve valve means being movable to a position opening said lateral port means in response to a predetermined high pressure from exterior of said tubular body; and

d. seal means initially sealingly engaged between said tubular body and said second sleeve valve means to prevent leakage of fluids between the interior and exterior of said body through said lateral port means.

4,429,748

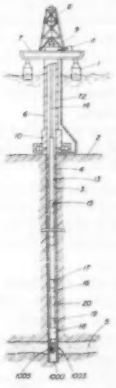
LOW PRESSURE RESPONSIVE APR TESTER VALVE

Harold K. Beck, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Continuation-in-part of Ser. No. 204,100, Nov. 5, 1980. This application Mar. 24, 1982, Ser. No. 361,303

Int. Cl.³ E21B *43/00*

U.S. Cl. 166—324 **11 Claims**



1. A valve for use in a well testing string located in a wellbore and having a packer arranged for selectively sealing the wellbore isolating that portion of the wellbore above the packer from that portion of the wellbore below the packer to allow the production of fluids from that portion of the wellbore below the packer through said valve in the testing string as well as the introduction of fluids into that portion of the wellbore below the packer through said valve in the testing string, said valve being responsive to changes in the pressure of the fluid in the annulus between the wellbore and the well testing string in that portion of the wellbore above the packer when the packer sealingly engages the wellbore, said valve comprising:

valve section means having a valve means therein in a closed position to prevent the flow of fluid through the well testing string, the valve means being responsive to changes in the pressure of the fluid in the annulus to open the valve means to allow the flow of fluid through the well testing string;

power section means responsive to changes in the pressure of the fluid in the annulus, the power section means having first means therein adapted to move the valve means of the valve section means to the open position and having resilient means therein adapted to return the valve means of the valve section means to the closed position from the open position in response to a change in the pressure of the

fluid in the annulus, wherein the power section means comprises:

power case means releasably secured to the valve section means and the isolation valve means;

power mandrel means slidably disposed within the power case means adapted to engage a portion of the valve section means to close the valve means therein;

fluid mandrel means secured within the power case means;

gas-fluid balancing seal means slidably disposed on the fluid mandrel means within the power case means; and

resilient ring assembly means retained within the power case means releasably securing the power mandrel means in either a first closed position or second open position within the power case means; and

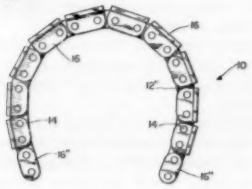
isolation valve means for being continuously responsive substantially without interruption during such time as said valve is located in said wellbore to changes in the pressure of the fluid in the annulus adapted to maintain the resilient means of the power section means at a level of force sufficient to close the valve means of the valve section means regardless of the hydrostatic pressure and temperature of the fluid in the annulus and the pressure and temperature of the fluid in said valve in the testing string.

4,429,749

FARRIER'S EQUINE HOOF-SIZER

Robert L. Nelms, Sparks, Nev., assignor to Allfarr Enterprises, Inc., Dallas, Tex.

Filed Jul. 30, 1982, Ser. No. 403,490
Int. Cl.³ A01L *7/00, 11/00*
U.S. Cl. 168—45 **3 Claims**



1. An equine hoof-sizer useful in farriery, comprising:

(A) plural overlapping links joined end-to-end to form three layers of links and thereby an articulable base;

(B) clips moveably overlying the base formed by the layers of links, said clips each having an upright hoof wall engaging clamp;

(C) fasteners joining the links and clips in a friction-fit, whereby upon conforming the hoof sizer clips to an equine hoof, the shape thereof may be retained until completion of a given equine shoeing.

4,429,750

RIDGE LEVELER

Jerry O. Pope, Rte. 1, Box 37, Loyal, Okla. 73756

Filed Jun. 1, 1981, Ser. No. 269,369
Int. Cl.³ A01B *25/00, 35/18*
U.S. Cl. 172—253 **12 Claims**

1. A ridge leveler system comprising:

a plow comprising:

a first forward row of discs mounted on the plow; and

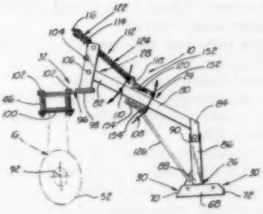
a first rearward row of discs mounted on the plow and spaced a distance from the first forward row of discs, the first rearward row of discs being positioned to plow substantially the same earth as plowed by the first forward row of discs when the plow is pulled in the forward direction;

a ridge leveler, comprising:

a bar assembly having a first end and a second end;

a ridge blade assembly connected to the first end portion of the bar assembly having a substantially flat ground engaging surface and a face having a sufficient area to engage the earth and to substantially level the engaged earth as the plow is being pulled in the forward direction; and

means for connecting the second end portion of the bar assembly to the first forward row of discs to support the ridge blade assembly in a plowing position wherein the ridge blade assembly engages a portion of the earth as



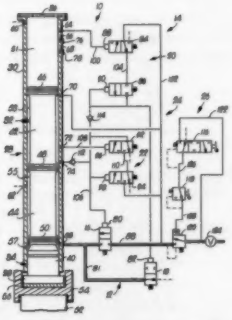
the plow is being pulled in the forward direction, the bar assembly and the ridge blade assembly connected thereto being positioned near the outermost discs of the first forward row of discs to engage and substantially level the outermost ridge of earth resulting from the outermost discs of the first forward row of discs plowingly engaging the earth as the plow is being pulled in the forward direction to reduce the volume of earth to be plowingly engaged by the outermost discs on the first rearward row of discs.

4,429,751

CONTROL SYSTEM FOR PILE HAMMERS

E. Don Jackson, Kansas City, Mo., and Ralph E. Myers, Kansas City, Kans., assignors to Conmaco, Inc., Kansas City, Kans.

Filed Oct. 26, 1981, Ser. No. 314,584
Int. Cl.³ B23Q *5/00;* **E21C** *5/00*
U.S. Cl. 173—13 **3 Claims**



1. A pressurized fluid control system for a pile hammer, said hammer including an elongated, tubular housing, said housing including structure defining a supply/exhaust port, first and second control air vents, a control air supply port, a plurality of hammer fully raised sensing orifices, a hammer partially raised sensing orifice and a hammer fully down sensing orifice, an axially shiftable piston disposed within said housing, means including a motive fluid conduit and a pressurized fluid source operatively connected to said housing for shifting said piston within said housing, said control system comprising:

a motive fluid valve assembly, said assembly including:

a supply valve operatively coupled to said motive fluid

conduit for controlling flow of motive fluid into said housing; and

an exhaust valve operatively coupled to said housing for controlling discharge of fluid from the housing; and

a control assembly for controlling the opening and closing of said supply and exhaust valves in response to the position of said piston within said housing, including control valve means and a plurality of control fluid conduits operatively coupling said control valve means, housing, and motive fluid valve assembly,

said control valve means comprising first, second, third and fourth control valves, each of said control valves including a pressure sensitive pilot;

said supply valve and said exhaust valve including a pressure sensitive pilot; and

said control fluid conduits including:

a first conduit selectively connecting one of said hammer fully raised sensing orifices and said pilot of said first control valve;

a second conduit connecting said pressurized fluid source and said first control valve, said control air supply port and said fourth control valve;

a third conduit connecting said first control valve and said control valve;

a fourth conduit connecting said hammer fully down sensing orifice and said pilot of said second control valve, said second control valve, said third control valve, said pilot of said fourth control valve, said pilot of said supply valve and said pilot of said exhaust valve;

a fifth conduit connecting said hammer partially raised sensing orifice and said pilot of said third control valve;

a sixth conduit connecting said third control and fourth control valves.

4,429,752

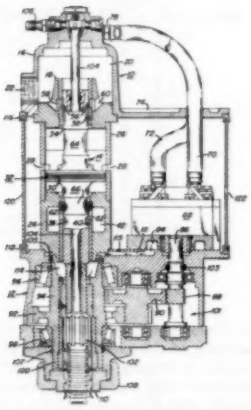
PNEUMATIC MOTOR FOR ROCK DRILLS AND THE LIKE

Edward A. Bailey, Newport, and Louis H. LeBlanc, Jr., Claremont, both of N.H., assignors to Joy Manufacturing Company, Pittsburgh, Pa.

Division of Ser. No. 110,857, Jan. 9, 1980, Pat. No. 4,340,121. This application Dec. 7, 1981, Ser. No. 328,055

Int. Cl.³ B25D *9/00*

U.S. Cl. 173—59 **3 Claims**



1. A lubrication system for the striking bar of a pneumatic rock drill assembly of the type having a non-coaxial drill rotation motor and of the type in which a drill rod is carried by said striking bar which is repeatedly struck by a reciprocating piston and wherein said striking bar is carried for reciprocation by a rotatable bushing connected through a gear train enclosed within a oil flooded gearbox to a pneumatic motor, said gearbox sealed to prevent loss of said oil, said system comprising: a passageway means in said rock drill assembly for directing exhaust air and oil from the pneumatic motor to the outer circumferential periphery of said striking bar to lubricate the lower end thereof.

4,429,753

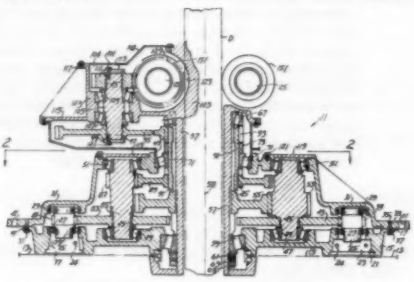
ROTARY PULL DOWN PULL UP DRIVE FOR DRILL PIPES

Richard Cushman, Westland, Mich., assignor to Noster Industries, Inc., Garden City, Mich.

Filed Jun. 21, 1982, Ser. No. 390,272

Int. Cl.³ E21C *1/10*

U.S. Cl. 173—149 **1 Claim**



1. A rotary pull down, pull up drive for a drill pipe comprising a centrally apertured housing mountable upon a platform and having a central vertical axis;

first and second reversible hydraulic motors spaced from said axis secured within said housing;

first and second upright motor drive shafts journaled within said housing;

an upright tubular output shaft projected through said housing and supportably journaled thereon upon said axis, and adapted to axially receive a drill pipe projected therethrough;

a first gear train within said housing interconnecting said first drive shaft and output shaft;

a centrally apertured superstructure housing spaced from and overlying said housing receiving said drill pipe mounted on and secured to said output shaft for rotation therewith;

a plurality of angularly related drill pipe feed rollers rotatably mounted and journaled upon said superstructure housing upon horizontal axes in operative driving engagement with said drill pipe for rotating and longitudinally feeding said drill pipe along said axis;

a spindle mounted around said output shaft rotatively journaled and supported upon said housing;

a second gear train within said housing interconnecting said second drive shaft and said spindle for rotating said spindle upon said axis relative to said output shaft;

and a plurality of third gear trains supported and journaled within and upon said superstructure housing respectively interconnecting said spindle and each of said drill pipe feed rollers;

rotation of said feed rollers upon horizontal axes in one direction feeding said drill pipe downwardly and in the opposite direction feeding said drill pipe upwardly, rotation of said feed rollers in a horizontal plane simultaneously rotating said drill pipe upon said vertical axis;

the mounting of each drill pipe feed roller including a horizontal top shaft mounted and journaled upon said superstructure housing;

a spherical bearing on and intermediate the ends of said top shaft;

said feed roller having a corresponding internal spherical

recess receiving said spherical bearing, whereby said feed roller on rotation in a horizontal plane relative to and against said feed pipe is adapted to rotate in a vertical plane relative to its supporting top shaft to frictionally dig into and operatively engage said feed pipe;

a side thrust pin slidably mounted upon said superstructure housing on an axis parallel to said top shaft;

a roller mounted upon said pin in operative engagement with a peripheral side portion of said feed roller;

and a spring means on said superstructure housing yieldably engaging and biasing said pin against said feed roller.

4,429,754

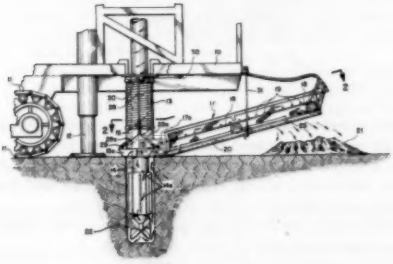
METHOD AND APPARATUS FOR CLEARING EARTH DRILL CUTTINGS FROM AROUND DRILL HOLES

Leo P. Cormier, P.O. Box 217, Hanna, Wyo. 82327

Filed Jul. 15, 1981, Ser. No. 283,433

Int. Cl.³ E21B *12/06*

U.S. Cl. 175—88 **3 Claims**



1. Apparatus for clearing a drill hole opening of cutting deposited about the margin of the opening by the drill during an earth drilling operation, comprising, in combination with a drilling rig having a deck through which the drill stem extends during the drilling operation and a skirt attached to the underside of said deck and adapted to surround the drill stem in spaced relationship therewith during a drilling operation, a hopper positioned below the skirt and having the lower end of the skirt attached thereto; and an elongate endless conveyor having one end positioned within said hopper and the length thereof extending exteriorly of the hopper to a dump site remote from the drill hole opening, whereby drill cuttings which tend to be deposited within the hopper about the drill stem are removed by the conveyor, said conveyor being of scraper type having an endless chain equipped with scraper blades and operating in a trough so that the scraper blades scrap drill cuttings along the bottom of the trough, the bottom of the trough having an elongate discharge opening extending therein and along the length thereof adjacent to the other end of the conveyor.

4,429,755

DRILL WITH POLYCRYSTALLINE DIAMOND DRILL BLANKS FOR SOFT, MEDIUM-HARD AND HARD FORMATIONS

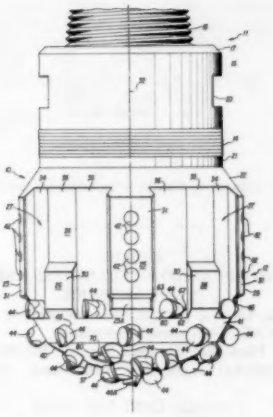
Kirk E. Williamson, P.O. Box 8156, Corpus Christi, Tex. 78412

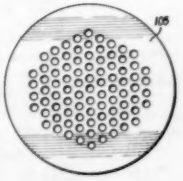
Filed Feb. 25, 1981, Ser. No. 237,971

Int. Cl.³ E21B *10/46, 10/60*

U.S. Cl. 175—329 **31 Claims**

1. A drill bit for oil or gas wells which comprises a shaft, a cylindrical bit body affixed to said shaft, said bit body having a convex end surface and a side surface, said side surface including a plurality of alternating raised portions and fluid channels defined between said raised portions, a plurality of cutters rigidly mounted on said end surface, one said cutter disposed to rotate closely proximate the bit's axis of rotation, a first set of cutters each disposed at a first equal radius from said axis and every cutter in said first set displaced from its adjacent cutter or cutters in said first set through equal arcs around said axis, and further successive sets of cutters, the cutters in each said set being disposed further radii equal in each said set and all cutters in each respective set being displaced from its adjacent cutter or cutters in its said set by substantially equal arcs





in each said set around said axis and having flat cutting faces which are slanted to the rear relative to their direction of rotation and otherwise generally face in said direction, said cutters tracing circular cutting paths around said axis which overlap and substantially cover the entire area of said end surface.

4,429,756

WEIGHING SCALE

Walter E. Jacobson, Meriden, and Douglas Bliss, Wallingford, both of Conn., assignors to Revere Corporation of America, Wallingford, Conn.

Filed Nov. 17, 1981, Ser. No. 322,197

Int. Cl.³ G01G *3/14*

U.S. Cl. 177—211 **4 Claims**

1. A weighing scale, comprising:

a. a rectangular platform for receiving a load to be weighted;

b. a rectangular base including four fulcrum means adjacent the corners of the base;

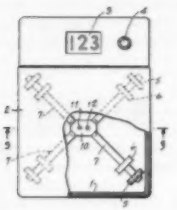
c. lever means including four deflectable arms extending diagonally inward from the corners of the base, said arms being supported by said fulcrum means, said lever means having recesses adjacent the inner ends of said arms;

d. four means on the platform abutting the four levers at points spaced from the four fulcrum means, for transferring the load from the platform to the lever means;

e. a bendable rectangular plate member having end portions tightly received in the recesses of the lever means;

f. strain gage means on said bendable plate member for

converting the strains developed therein into an electrical signal; and

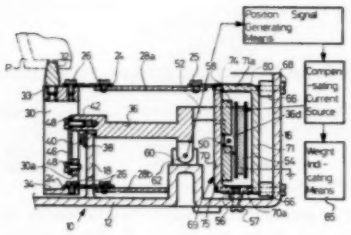


g. weight indicating means responsive to the electrical signal.

4,429,757
WEIGHING APPARATUS INCLUDING A SECTIONAL YOKE MEMBER

Peter Kunz, Gossau, Switzerland, assignor to Mettler Instrumente AG, Greifensee, Switzerland

Filed Mar. 23, 1982, Ser. No. 361,360
Claims priority, application Switzerland, Jun. 2, 1981, 3739/81
Int. Cl.³ G01G *7/00, 23/48*
U.S. Cl. 177—212 **6 Claims**



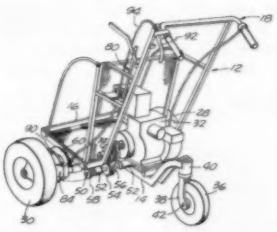
1. Weighing apparatus of the electromagnetic load compensation type, including a housing (**10**), a load receiving member (**30**) connected for vertical movement relative to said housing, means connected with the housing for establishing a stationary permanent magnetic field, and compensation circuit means including a coil (**54**) connected with said load receiving member for movement in said magnetic field;
the improvement wherein said field establishing means comprises
(a) a hollow sectional open-ended soft iron yoke member (**69**) having in transverse cross-section a generally rectangular cross-sectional configuration, said yoke member comprising an assembly of a pair of generally identical L-shaped sections (**70, 71**) that extend longitudinally the length of said yoke member; and
(b) at least one flat permanent magnetic member (**74**) connected with said yoke member for establishing a flow of magnetic flux therein.

4,429,758
MOTORIZED CART

Eli Meshulam, 1108 E. Pico Blvd., Los Angeles, Calif. 90021

Filed Oct. 15, 1981, Ser. No. 296,317
Int. Cl.³ B62D *51/04*
U.S. Cl. 180—19 R **9 Claims**

1. A motorized cart comprising:
(a) a base frame;
(b) a load carrying platform mounted on said base frame;
(c) roller means carried by said base frame for rollably supporting said base frame and said load carrying platform while the cart and its load is being moved from place to place, said roller means comprising:
(1) a transversely extending axle carried by said base frame, said axle having a transversely extending first axis;
(2) a pair of transversely spaced apart first and second wheels rotatable about said first axis;
(3) at least one third wheel rollably carried by said base frame rearwardly of said first and second wheels, said

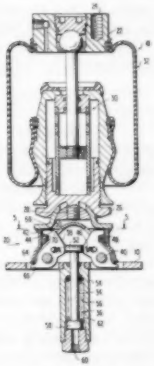


third wheel being rotatable about a second axis longitudinally rearwardly spaced apart from said first axis; and
(4) a differential means drivably interconnected with said first and second wheels and adapted to permit said first and second wheels to rotate at different speeds;
(d) driving means for driving said pair of transversely spaced apart wheels, said driving means comprising:
(1) a motor carried by said base frame;
(2) connecting means for interconnecting said motor and said differential means to drive said first and second wheels; and (e) upstanding handle means for guiding the path of travel of the cart.

4,429,759
LATCH MECHANISM

Ray Clark, Pewaukee, Wis., assignor to Applied Power Inc., Milwaukee, Wis.

Filed Feb. 11, 1982, Ser. No. 348,141
Int. Cl.³ B62D *27/06*
U.S. Cl. 180—89.14 **8 Claims**



1. A mechanism for latching a first body to a second body, said mechanism comprising:
(a) a plunger operable to be mounted on the first body;

(b) first means for moving said plunger back and forth between a first position and a second position including, hydraulic means for forcing said plunger from its first position to its second position;

(c) a pair of opposing latch hooks operable to be pivotably mounted on the first body symmetrically about said plunger for pivotal movement between a first, locking position in which said latch hooks are in contact with said plunger when said plunger is in its first position and a second retracted position;

(d) catch means operable to be mounted on the second body in position for engagement by said latch hooks when said latch hooks are in a first, locking position;

(e) said plunger having an enlarged head which is in contact with said latch hooks when said plunger is in its first position;

(f) second means for biasing said latch hooks toward a second, unlocked position and withdrawing said latch hooks from contact with said catch means when said plunger is in its second position;

(g) extension means formed on the opposite sides of the pivots of each of said latch hooks such that mechanical contact of said extension means will serve to pivot said latch hooks; and

(h) mechanical actuating means connected to said catch means for mechanically engaging said extension means as said first and second bodies come into engagement and for pivoting said pair of opposing latch hooks into locking engagement with said catch means.

4,429,760

REAR-WHEEL SUSPENSION DEVICE FOR A TRICYCLE VEHICLE

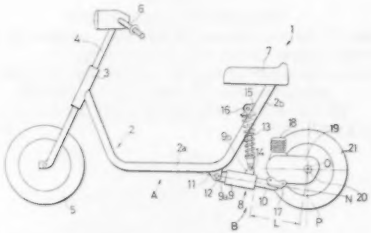
Shinichi Koizumi, Tokyo; Takeshi Kawaguchi, Saitama, and Katsuyoshi Kawasaki, Tokyo, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 2, 1981, Ser. No. 307,866

Claims priority, application Japan, Oct. 3, 1980, 55-138384; Dec. 19, 1980, 55-180168

Int. Cl.³ B62D *61/08;* B62K *5/06*

U.S. Cl. 180—215 **7 Claims**



1. A rear-wheel suspension device on a tricycle vehicle, comprising:

front and rear vehicle portions, said front vehicle portion having a frame;

a pair of rear wheels mounted on said rear vehicle portion by said axles;

a rolling joint interconnecting said front and rear vehicle portions, said rolling joint including a casing having a sleeve bearing therein and pivotably mounted on said frame for substantially up and down angular movement with respect to said front vehicle portion of said tricycle vehicle, said rolling joint further including a spindle rotatably mounted in said casing, said axles having a fixed positional relationship with a longitudinal axis of said rolling joint; and

a shock absorber interposed between said frame and said casing.

2. A rear-wheel suspension device according to claim 1, including a power unit supporting said rear wheels for driving said rear wheels through said axles, said spindle being rigidly connected to said power unit.

4,429,761

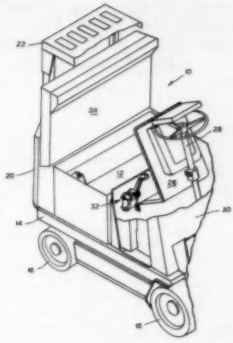
SEAT AND CONTROL LEVER INTERLOCK

Louis A. Haddock, Jr., and Ronald L. Jones, both of Battle Creek, Mich., assignors to Clark Equipment Company, Buchanan, Mich.

Filed Aug. 17, 1981, Ser. No. 293,055

Int. Cl.³ B60K *28/00*

U.S. Cl. 180—271 **8 Claims**



1. In a lift truck having a power source compartment, an operator seat mounted forwardly of the compartment for forward pivotal movement from a normal position in which the seat extends over a portion of the compartment and operator control lever means adjacent the seat mounted for forward pivotal movement from a normal position in which the control lever means extends over a portion of the compartment, interlocking linkage means operatively connected between the seat and control lever means responsive to forward pivotal movement of said seat for maintaining said control lever means in a forwardly pivoted inoperative position following movement of the control lever means to said forwardly pivoted position, said seat being mounted pivotally from a transverse pivot shaft and said linkage means being operatively connected between said shaft and said control lever means, whereby forward pivotal movement of said seat rotates said shaft to cause actuation of said linkage means.

4,429,762

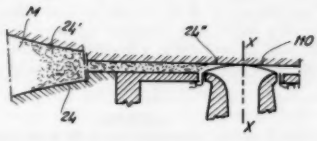
HORN LOUDSPEAKERS OF THE SECTORIAL DIFFUSION TYPE, AND METHOD FOR MAKING SAID LOUDSPEAKERS

Mario Cesati, Via de Vitalis, 16, Brescia, Italy

Filed May 1, 1981, Ser. No. 259,559

Int. Cl.³ G10K *11/10*

U.S. Cl. 181—159 **4 Claims**



1. A loudspeaker of the sectorial diffusion type, which comprises two first opposite walls forming a horn, an electroacoustic transducer provided with a curved diaphragm tangentially contacting a third wall, said diaphragm and said third wall

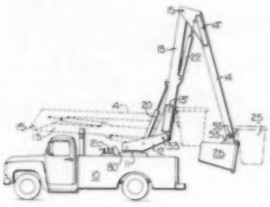
forming a structure, said two first walls being arranged in a direction essentially perpendicular to the vertical axis of said structure, and converging towards said structure, said diaphragm, said third wall and said horn forming a compression chamber, a mass of fibrous material in a sector of said compression chamber in an amount sufficient to absorb the acoustic power irradiated from the compression chamber in a predetermined direction in which diffusion or sound has to be deadened.

4,429,763

BUCKET ROTATION SYSTEM FOR AERIAL TOWER

Timothy B. Houck, Raleigh, N.C., assignor to Technical and Safety Consultants, Inc., Raleigh, N.C.

Filed Mar. 4, 1982, Ser. No. 354,657
Int. Cl.³ B66F *11/04*
U.S. Cl. 182—2 **4 Claims**



1. In a truck supported aerial tower including a first boom section supported at one end for pivotal and rotational movement on said truck, a second boom section pivotally supported at one end to the other end of said first boom section, motive means for imparting selected movement to said first boom section relative to said truck and to said second boom section relative to said first boom section, a workman support bucket supported for pivotal movement on the other end of said second boom section, and a mechanical leveling system extending from said truck to said workman support bucket and including at least one closed loop of flexible elongate material extending along said first and second boom sections, said closed loop including adjacent runs movable in opposite directions upon movement of said boom sections to normally maintain said workman support bucket in a vertical position throughout the range of movement of said first and second boom sections, adjustment means in said closed loop for making minor adjustments of said workman support bucket relative to the vertical position, the combination therewith of a bucket rotation system including operator means interposed in said closed loop, said operator means being movable between active and inactive positions and independently of said minor adjustment means, said operator means normally being maintained in said inactive position to maintain said workman support bucket in the vertical position, and control means operatively connected to said operator means, said control means being operable to immediately move said operator means from said normal inactive position to said active position and to thereby impact sufficient movement in opposite directions to said adjacent runs independently of movement of said boom sections to immediately move said workman support bucket from the normal vertical position to a horizontal position to facilitate removal of an injured workman from said support bucket.

4,429,764

SCAFFOLD SYSTEM FOR USE IN SANDBLASTING

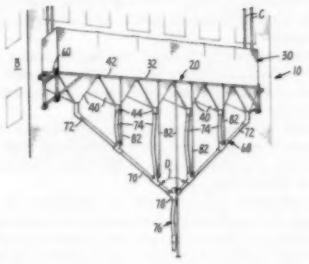
John W. Park, 1820 Sweetwood Dr., Colma, Calif. 94015

Filed Feb. 22, 1983, Ser. No. 468,370
Int. Cl.³ E04G *3/10*
U.S. Cl. 182—129 **10 Claims**

1. A scaffold system adapted to be raised adjacent the side of a building, said system for use in a sandblasting operation, said system comprising:

an elongated planar platform;

a plurality of inverted pyramidal troughs connected to the bottom surface of said platform, each trough having an open upper end and an outlet means formed in the lower apex portion thereof, said troughs being mounted along the length of said platform in abutting, side-by-side relationship, with said troughs projecting outwardly beyond the elongated side edges of said platform;



conduit means connected to the outlet means of each said trough for channeling sand accumulated therein, downwardly;

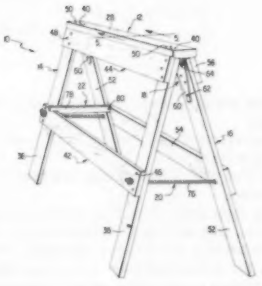
enclosure means extending upwardly from the upper surface of said platform, said enclosure means surrounding both ends of said platform and the side edge thereof which is spaced away from the building, whereby when a sandblasting operation is carried out on said platform, sand particles and any material removed from the side of the building will be contained by said enclosure and directed into said troughs to be channeled by said conduit means directly to the ground.

4,429,765

COLLAPSIBLE SAWHORSE

Gilbert C. Garcia, Corpus Christi, Tex., assignor to Homer Ramos, Corpus Christi, Tex., a part interest

Continuation-in-part of Ser. No. 216,019, Dec. 12, 1980. This application Apr. 27, 1982, Ser. No. 372,153
Int. Cl.³ B27B *21/00*; F16M *11/00*; A47B *37/00*
U.S. Cl. 182—153 **9 Claims**



1. A collapsible sawhorse moving between storage and load supporting positions, comprising

an elongate beam of generally pentagonal cross-section having a length dimension, a width dimension and a thickness dimension, the beam having a planar upper surface corresponding to the base of the pentagon, a pair of gener-

ally parallel sides intersecting the upper surface and corresponding to the sides of the pentagon and first and second downwardly extending converging bottom faces intersecting the parallel sides;

a first pair of generally straight parallel spaced legs having a long dimension and an end generally perpendicular to the long dimension, the end abutting the first bottom face of the base;

means rigidly connecting the end and the first bottom face;

a second pair of generally straight parallel spaced legs having a long dimension and an end generally perpendicular to the long dimension, the second legs being of generally the same size as the first legs;

a pair of hinges connecting the first and second legs including a first arm connected to the first leg, a second arm connected to the second leg and a pivot connection located adjacent the convergence of the base bottom faces; the arrangement between the hinges and the second legs being such as to abut the ends of the second legs against the second bottom face in load supporting position of the sawhorse;

means for limiting pivotal movement of the second legs relative to the first legs in a spreading direction; and

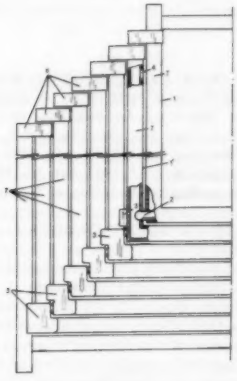
means for selectively preventing pivotal movement of the legs toward each other.

4,429,766

LADDER CONSISTING OF SLIDING SECTIONS

D. Salvador Alimbau Marques, Barcelona, Spain, assignor to Andral Corporation, Williamsville, N.Y.

Filed Sep. 13, 1982, Ser. No. 417,382
Int. Cl.³ E06C 1/12
U.S. Cl. 182—195 **14 Claims**



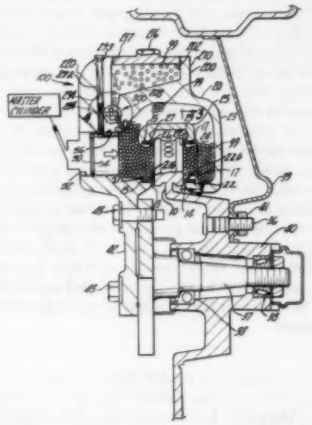
1. A new sliding section ladder, comprising sections of varying widths made up of u-shaped modules, comprising a base and upright sections, each module being smaller in width than the one immediately before it, the outer sides of the smaller module backing into the inside of the immediately larger module, whereby the base and upright sections of the u-configuration of the smaller module are adjacent to the u-shaped base and upright sections of the larger module when said ladder is in a closed position and wherein said base sections decrease in width as they approach the top of said ladder when said ladder is in an open position.

4,429,767

PELLETIZED BRAKE LINING DISC BRAKE

Robert L. Jenkins, 545 Yarboro, Bloomfield Hills, Mich. 48013

Filed Aug. 25, 1980, Ser. No. 181,147
Int. Cl.³ F16D 65/52
U.S. Cl. 188—71.8 **3 Claims**



1. A brake device having a rotatable disc, said device comprising:

a stationary support;

a nonrotating housing mounted to said support and spaced away from and extending across the periphery of said rotatable disc;

a chamber in said housing extending radially inwardly on opposite sides of said rotatable disc, said chamber having portions defining a cavity and a guide bore extending from said cavity and oriented perpendicular to the face of said rotatable disc;

a sleeve fitted into said guide bore; a plurality of brake lining pellets stored in said cavity and in said sleeve;

moving means, mounted in said chamber, for moving said brake lining pellets against said rotatable disc so that the relaive motion between said disc and said nonrotating housing is retarded when said moving means is engaged, said moving means further comprising a piston mounted within said guide bore, and actuating means, mounted in said chamber, for actuating said piston against said brake lining pellets; and

replenishing means, mounted in said chamber, for replenishing said brake lining pellets in said cavity when at least one of said brake lining pellets is expended, said replenishing means further comprising a pellet storage reservoir mounted on said chamber, and feeding means, disposed in said chamber, for feeding at least one of said brake lining pellets from said pellet storage reservoir into said cavity when at least one of said brake lining pellets is expended;

wherein said chamber further has portions defining a first passage extending perpendicularly to the axis of said guide bore, a second passage extending from the bottom of said pellet storage reservoir toward said cavity, said second passage communicating with said pellet storage reservoir to pass at least one of said brake lining pellets from said pellet storage reservoir into said second passage, an opening having its axis disposed perpendicular to and communicating with said first passage, said opening further communicating with said second passage and a third passage connecting said opening to said cavity for flow communication therebetween so as to pass at least one of said brake lining pellets therethrough;

and further wherein said feeding means comprises:

a feeder member rotatably mounted in said opening, said

feeder member having a first disc and a second disc mounted to the face of said first disc, said first disc having a plurality of cavities formed in the periphery of said first disc for holding at least one brake lining pellet therein, said first disc further connecting said second passage with said third passage; and

rotating means, mounted in said first passage and coupled to said second disc, for rotating said feeder member in one direction of rotation in response to the movement of said piston in said guide bore to advance at least one of said brake lining pellets from said second passage into said opening, into said third passage and into said cavity such that when said piston moves in one direction in said guide bore to squeeze said brake lining pellets in said cavity against said rotatable disc and when at least one of said brake lining pellets is expended, said rotating means rotates said feeder member when said piston moves in the opposite direction so that at least one of said brake lining pellets in said second passage is advanced into one of said cavities in said first disc and said brake lining pellet is rotated by said feeder member into said third passage and into said cavity so as to replenish said cavity with at least one of said brake lining pellets when said rotating means is engaged.

4,429,768

BRAKES

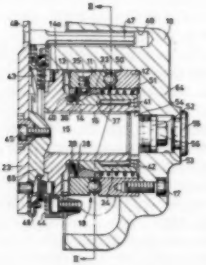
Hugh G. Margetts, Leamington Spa, and Charles H. Pace, Solihull, both of England, assignors to Lucas Industries Limited, Birmingham, England

Filed Apr. 21, 1978, Ser. No. 898,865

Claims priority, application United Kingdom, Apr. 22, 1977, 16763/77

Int. Cl.³ F16D *55/08*

U.S. Cl. 188—71.9 **15 Claims**



1. A mechanical brake actuator for a vehicle brake comprising a housing having an axis, a non-rotatable cam component fixed in or integral with said housing, a rotatable cam component in said housing and rotatable about said axis, said rotatable cam component being radially spaced from said housing throughout its circumference to define an annular clearance, said cam components each having a respective helical cam groove therein, said cam grooves being complementary to one another and axially confronting one another, a plurality of balls between said two axially confronting helical cam grooves to form a helical thrust bearing, and an elongate member extending generally tangentially and engaging said rotatable cam component at a point spaced from said axis for rotating the rotatable cam component in a direction to effect axial displacement of that component relative to said housing, said helical cam grooves having sufficient depths that the lateral reaction arising from the application of a lateral force to the rotatable cam component by said elongate member is transmitted to said non-rotatable cam component and thereby to said housing by the action of the balls of said helical thrust bearing on the walls of said helical grooves.

4,429,769

FLOATING CALIPER TYPE DISC BRAKE

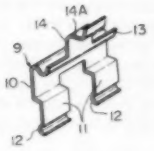
Harumi Oshima, and Tukasa Uno, both of Kanagawa, Japan, assignors to Tokico Ltd., Kanagawa, Japan

Filed Mar. 31, 1982, Ser. No. 363,780

Claims priority, application Japan, Mar. 31, 1981, 56-45936

Int. Cl.³ F16D *65/09, 65/20*

U.S. Cl. 188—73.31 **2 Claims**



1. A floating caliper type disc brake comprising a pair of friction pads, a caliper adapted to be mounted on a stationary member to slide thereon in the direction of the axis of a rotatable disc, each of said friction pads having on opposite ends in the direction of the circumference of the disc projections for mounting slidably the friction pads on said stationary member, and a guide plate adapted to be interposed between the stationary member and each of projections of friction pads in mounting the friction pads on the stationary member, said guide plate having a generally channel shaped retaining portion for engaging slidably with the projection of the friction pad, an upwardly extending hook portion extending from the upper end of the retaining portion and along the side surface of the caliper, and a hook provided on the upper end of the hook portion and adapted to engage with a circumferentially projecting lug provided on the side surface of the caliper, thereby suspending the friction pads on the caliper when the caliper and the friction pads are disassembled from the stationary member.

4,429,770

FRICTION LINING CARRIER MEMBER HAVING REPLACEABLE FRICTION LININGS

Helmut Weisbrod, Bad Nauheim, Fed. Rep. of Germany, assignor to ITT Industries, Inc., New York, N.Y.

Continuation of Ser. No. 205,132, Nov. 10, 1980, abandoned. This application Nov. 15, 1982, Ser. No. 441,460

Claims priority, application Fed. Rep. of Germany, Nov. 26, 1979, 2947606

Int. Cl.³ F16D *51/00, 69/04*

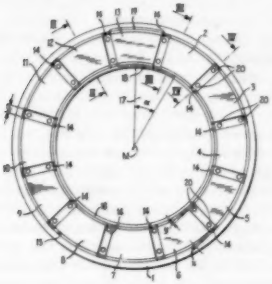
U.S. Cl. 188—73.32 **9 Claims**

1. A circular friction lining carrier member having a plurality of replaceable friction linings comprising:

said carrier member having a first groove disposed at an outer portion thereof and a second groove disposed at the inner portion thereof, said plurality of linings being guided in and held captive in said first and second grooves; and

a supporting element for transmitting circumferential forces acting on said plurality of linings during operation to said carrier member disposed between each adjacent ones of said plurality of linings, each of said supporting elements being a solid rectangular member of square cross section immovably fastened to said carrier member by at least one fastening element extending through said rectangular member into said carrier member with each end of each of said rectangular members being radially spaced from an associated one of said first and second grooves, each of said rectangular members being in a non-overlapping, circumferential force transmitting relationship with a

length of adjacent edges of said adjacent ones of said plurality of linings coextensive with the length of an associated one of said rectangular members to receive said circumferential force.

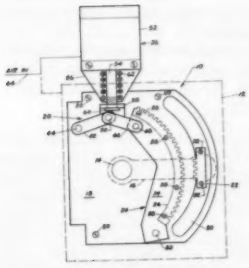


4,429,771

MECHANICAL AIR FAILURE BRAKE

Thomas E. Martin, Chesterland, Ohio, assignor to The Babcock & Wilcox Company, New Orleans, La.

Filed Aug. 26, 1981, Ser. No. 296,395
Int. Cl.³ F16D *65/24*
U.S. Cl. 188—170 8 Claims



1. In a control drive mechanism comprising a control shaft movable through a predetermined angle of rotation, and a lever attached to and rotatable with said shaft, a brake mechanism comprising a first rack section mounted on said lever, a second rack section mounted for rotation on a fixed pivot and movable between a first position out of engagement with said first rack section and a second position engaged with said first rack section, means biasing said second rack section into said second position, and air motor means connected to said second rack section and operable to move said second rack section to said first position against said biasing means.

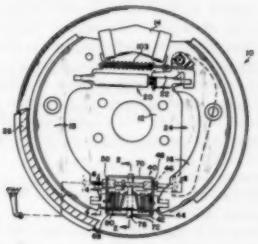
4,429,772

DRUM BRAKE ANCHOR ASSEMBLY

James K. Roberts, South Bend, Ind., assignor to The Bendix Corporation, Southfield, Mich.

Filed Sep. 14, 1981, Ser. No. 301,626
Int. Cl.³ F16D *51/24, 51/52*
U.S. Cl. 188—328 6 Claims

1. A drum brake assembly with an anchor assembly defining a duo mode of operation, a pair of brake shoes movable by a hydraulic actuator during a service brake operation to a braking position, a parking lever assembly cooperating with the pair of brake shoes to move the latter to the braking position during a parking brake operation, a backing plate supporting the hydraulic actuator, the anchor assembly and the pair of brake shoes, the anchor assembly defining a first mode of operation during the service brake operation to transfer torque developed during braking to the backing plate via the anchor assembly, the anchor assembly defining a second mode of operation during the parking brake operation to substantially prevent the transfer of torque developed during braking to the anchor assembly, and the anchor assembly including a connecting member extending between the pair of brake shoes, the connecting member being fixed laterally relative to the backing plate during the first mode of operation, characterized by



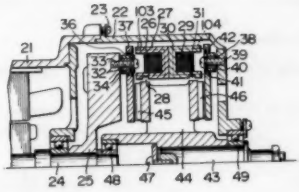
said anchor assembly further including a bracket supporting the connecting member, said bracket also supporting a portion of the parking lever assembly, and the connecting member being rotatable from its position in the first mode of operation in response to movement of said portion in order to reach a position permitting movement in the second mode of operation, the connecting member including a transversely extending pin and said bracket defines at least one slot for receiving said pin in the first mode of operation, whereby the pin is fixed laterally within the one slot in the first mode.

4,429,773

ELECTROMAGNETIC CLUTCH AND BRAKE

Takashi Dohi; Nozomu Shinozaki, both of Hirakata, and Shigeo Neki, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jul. 21, 1981, Ser. No. 287,074
Claims priority, application Japan, Jul. 31, 1980, 55-106125; Nov. 17, 1980, 55-162424; Nov. 17, 1980, 55-162425; Nov. 17, 1980, 55-162426; Jan. 30, 1981, 56-13438
Int. Cl.³ B60K *41/24*
U.S. Cl. 192—18 B 8 Claims



1. An electromagnetic clutch for use with a motor having a fixed bracket and a rotatable motor shaft, comprising

a flywheel attached to said motor shaft for rotation therewith;

an output shaft rotatably supported by said bracket, the axis of rotation of said output shaft being substantially coaxial with the axis of rotation of said motor shaft;

a clutch rotor attached to said output shaft, said clutch rotor being located between said flywheel and a radial portion of said bracket;

a clutch section including

a plurality of clutch pins attached to a face of said flywheel opposing said clutch rotor;

a plurality of clutch sliding members, each of said clutch sliding members surrounding one of said plurality of clutch pins and being axially displaceable with respect thereto;

a clutch ring having a plurality of apertures therein, each of said apertures surrounding one of said plurality of clutch sliding members;

a plurality of clutch buffer members interposed between each of said plurality of clutch sliding members and said clutch ring, said clutch ring being prevented from rotating relative to said flywheel but being displaceable in the axial direction with respect thereto, said buffer members permitting radial expansion of said clutch ring with respect to said flywheel; and

a clutch solenoid secured to said bracket adjacent said clutch ring, energization of said clutch solenoid bringing said clutch ring into contact with said clutch rotor, whereby said output shaft is rotated as a unit with said motor shaft; and

a brake section including

a plurality of brake pins attached to a face of said bracket opposing said clutch rotor;

a plurality of brake sliding members, each of said brake sliding members surrounding one of said plurality of brake pins and being axially displaceable with respect thereto;

a brake ring having a plurality of apertures therein, each of said apertures surrounding one of said plurality of brake sliding members;

a plurality of brake buffer members interposed between each of said plurality of brake sliding members and said brake ring, said brake ring being prevented from rotating relative to said bracket but being displaceable in the axial direction with respect thereto, said buffer means permitting radial expansion of said brake ring with respect to said bracket; and

a brake solenoid secured to said bracket adjacent said brake ring, energization of said brake solenoid bringing said brake ring into contact with said clutch rotor, whereby the rotation of said output shaft is stopped.

4,429,774
PAWL AND RATCHET MECHANISM

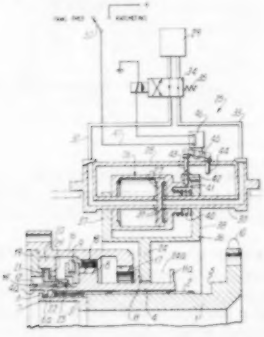
Herbert A. Clements, Woking, and Robert H. Heybourne, Thames Ditton, both of England, assignors to S. S. S. Patents Limited, Middlesex, England

Filed Oct. 19, 1981, Ser. No. 312,701

Claims priority, application United Kingdom, Oct. 27, 1980, 8034573

Int. Cl.³ F16D *23/08, 23/10*

U.S. Cl. 192—53 H **12 Claims**



1. In a pawl and ratchet mechanism having a movable baulking member which may be set in both a ratcheting and a pawl free condition in which the pawl and ratchet components of the mechanism are respectively in and out of engagement with each other, the baulking member also being settable in a baulking condition which prevents relative movement of the said components into the ratcheting condition, the baulking member being maintained in the baulking condition when the relative rotation of the said components in inappropriate to permit the mechanism to be operated in the ratcheting condition, and a thrust member which is engageable with the baulking member or with means connected thereto and which is movable in first and second directions in which the baulking member is respectively moved towards and away from the ratcheting condition the improvement which comprises thrust switching means settable in first and second conditions in which, in operation, thrust is imparted to the thrust member to cause the latter to move respectively in the said first and second directions and detector means which detects when the baulking member has moved into the baulking condition and when the baulking member has moved out of the baulking condition and into the pawl free condition, the detector means controlling the setting of the thrust switching means so that, in operation, when the baulking member is in the baulking condition, the thrust switching means is so set that the thrust moves the baulking member towards the pawl free condition, and when the baulking member has moved into the pawl free condition, the thrust switching means is so set that the thrust moves the baulking member towards the ratcheting condition.

4,429,775
CLUTCH TYPE TORQUE CONTROL DEVICE FOR AIR DRIVER

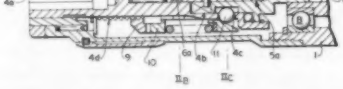
Hirokazu Teramoto, Nara, Japan, assignor to Uryu Seisaku, Ltd., Osaka, Japan

Filed Mar. 5, 1981, Ser. No. 240,615

Claims priority, application Japan, Mar. 5, 1980, 55-28264

Int. Cl.³ B60K *41/02;* **F16D** *7/02*

U.S. Cl. 192—0.096 **6 Claims**



1. A clutch type torque control device, comprising:

a longitudinally extending housing having a front end and a rear end, having a central, longitudinally extending, first cavity open at said front and rear ends, and having a central longitudinally extending axis along said first cavity;

a main shaft having a work end at said front end and extending in said first cavity toward said rear end, said main shaft being rotatable about said central axis and having a longitudinally extending second cavity opening at its rearmost end and a radially extending passage opening into said second cavity, said main shaft having a rear portion having a plurality of ball receiving holes circumferentially spaced about said central axis rearward of said passage;

a drive shaft rotatable about said central axis extending longitudinally rearward of said main shaft;

a plurality of balls movably fitted in said plurality of ball receiving holes;

a cam located between said main shaft and said drive shaft, rotatable with said drive shaft about said central axis, having cam surfaces including substantially flat cam surfaces for engaging said plurality of balls so as to rotate said plurality of balls and said main shaft therewith about said

central axis, and having intermediate cam surfaces between said substantially flat cam surfaces closer to said plurality holes than said substantially flat cam surfaces;

means, including a first spring, for pushing said plurality of balls through said plurality of ball receiving holes against said cam surfaces, whereby a predetermined torque on said cam through said drive shaft pushes said plurality of balls aginst the force of said first spring from said flat cam surfaces onto said intermediate cam surfaces releasing the torque from said main shaft, whereby said cam rotates independently of said main shaft;

a pilot pin mounted to said cam for rotation about said central axis therewith and for movement with respect thereto in opposite first and second longitudinal directions extending into said second cavity and having an outer planed-off surface longitudinally forward of said cam;

a stop pin slidably mounted in said passage having a first end abutting said pilot pin and a second end, said first end being fittable onto said planed-off surface;

a second spring engaging said stop pin at said second end and said pilot pin, for pressing said stop pin radially inward into abutting contact with said pilot pin, said stop pin engaging said planed-off surface during rotation of main shaft with said cam so as to block movement of said pilot pin in said second direction, rotation of said pilot pin with said cam relative to said main shaft pushing said stop pin radially outward and off said planed-off surface;

an air driven motor in said housing engaging said drive shaft for rotating said drive shaft about said central axis;

means, responsive to longitudinal movement of said pilot pin in said opposite first and second longitudinal directions, for respectively providing and closing off access of pressurized air through said first cavity to said motor for driving said motor; and

means for urging said pilot pin in said second directions so as to push said pilot pin in said second direction when said stop pin is off said planed-off surface.

4,429,776
FRICTION CLUTCH

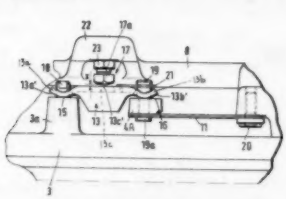
Paul Maucher, Sasbach, and Patrick Weydmann, Bühlertal, both of Fed. Rep. of Germany, assignors to Luk Lamellen und Kupplungsbau GmbH, Bühl, Fed. Rep. of Germany

Filed Feb. 6, 1981, Ser. No. 232,246

Claims priority, application Fed. Rep. of Germany, Feb. 6, 1980, 3004277

Int. Cl.³ F16D *13/50, 13/56*

U.S. Cl. 192—99 A **48 Claims**



1. A friction clutch for use in automotive vehicles or other machines of the type having a rotary driving element, comprising a housing secured to said element; first and second pressure plates disposed between said housing and said element and arranged to normally rotate with said element; first and second friction discs respectively interposed between said element and said housing on the one hand and said first and second plate on the other hand; means for biasing said plates into engagement with the respective discs; and disengaging means including at least one release member mounted on said housing and movable from a first to a second position to thereby move one of said plates away from the respective disc, and at least one changeover lever interposed between said housing on the one hand and said plates on the other hand and movable from a first to a second position to thereby move the other of said plates away from the respective disc in response to movement of said release member to said second position, said lever having first and second arms respectively contacting said first and second plates and a median portion between said arms, said housing having a portion defining a fulcrum for said median portion of said lever during movement of said lever to said second position, said arms having first surfaces and said pressure plates having second surfaces which abut against and along which the respective first surfaces roll during movement of said lever relative to said fulcrum, said median portion of said lever being free to perform a pivotal as well as at least one additional movement with reference to said fulcrum.

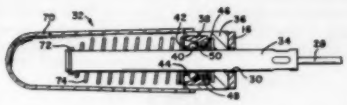
4,429,777
AUTOMATIC LOCKING AND ADJUSTMENT ASSEMBLY

Alistair G. Taig, South Bend, Ind., assignor to The Bendix Corporation, Southfield, Mich.

Filed Aug. 10, 1981, Ser. No. 291,646

Int. Cl.³ F16D *13/75*

U.S. Cl. 192—111 A **7 Claims**



1. An automatic locking and adjustment assembly for fixing a cable to a housing which includes a variable setting relative to the cable, the housing including a cam, gripping means engageable with the cam and the cable to fix the latter to the housing, a cage carrying the gripping means relative to the housing and the cable a first resilient member biasing the housing to an initial setting relative to the cable and a second resilient member biasing the gripping means to a first position relative to the cage, the cable being movable slightly relative to the housing away from a rest position setting to fixedly engage the gripping means with the cam and the cable, characterized by said cage frictionally engaging said cable to carry said gripping means in spaced relation to said cam when said cable is in its rest position and said cage defining a lost motion connection for carrying said gripping means, said lost motion connection providing for said cage to move relative to said cable when said cable is moved relative to said housing and said lost motion connection also providing for said cage to move with said cable at a different rate of travel than said gripping means when said cable is returned to its rest position.

4,429,778
CONDITIONING TIME CONTROL FOR VENDING BY SELECTION

Joseph L. Levasseur, Chesterfield, Mo., assignor to H. R. Electronics Company, St. Louis, Mo.

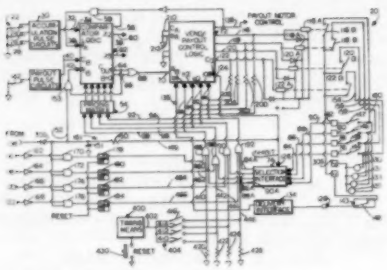
Filed Jul. 15, 1981, Ser. No. 283,656

Int. Cl.³ G07F *5/16*

U.S. Cl. 194—10 **30 Claims**

1. A conditioning time control for controlling the pre-vend time conditioning of products in a multi-selection vendor having credit entry means, vend selection means actuatable to select a vend selection, each vend selection having a pre-established vend price associated therewith, and vend producing means for effecting delivery to a customer of a product associated with the selected vend selection when the credit entry is at least equal to the vend price for the selected vend selection, said conditioning time control including means to inhibit vending of the products associated with a particular vend selection for a period of time in order to permit pre-vend time conditioning of such products, conditioning selection means

actuatable by authorized personnel for individually establishing particular vend selections to be inhibited, and reset means operable by authorized personnel, said inhibiting means being responsive to actuations of said conditioning selection means and to operation of said reset means to effect pre-vend time



conditioning of the products associated with the vend selections established by actuation of the conditioning selection means, said inhibiting means effecting pre-vend time conditioning by inhibiting vending of such products for a period of time subsequent to operation of the reset means while permitting vending of products associated with other vend selections.

4,429,779

RESERVOIR FOR ROD-LIKE ARTICLES

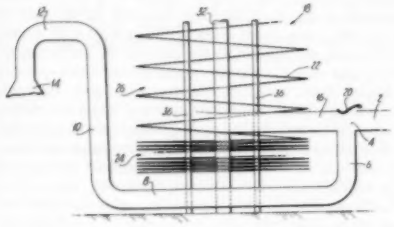
Dennis Hinchcliffe, London, England, assignor to Molins Limited, London, England

Filed Jul. 8, 1981, Ser. No. 281,330

Claims priority, application United Kingdom, Jul. 17, 1980, 8023317

Int. Cl.³ B65G *1/00*

U.S. Cl. 198—347 **11 Claims**



1. A reservoir for rod-like articles, comprising longitudinally-rigid support means having a helically-extending support surface including a leading end for supporting a continuous stack of rod-like articles; and means for progressively and reversibly driving said support surface along a path from a storage position, in which it is compactly stored with adjacent turns closely spaced, to an operative position, in which adjacent helical turns are spaced apart to allow a stack of rod-like articles to be conveyed thereon, including a plurality of longitudinally-spaced drive means arranged along said path and engaging said support surface for feeding said support surface along said path and guide means extending between said drive means and defining said path therebetween along which said support surface is fed by said drive means, whereby said leading end and successive increments of said support surface may be reversibly engaged by and conveyed between successive drive means as said support surface is fed along said path, and so that progressively more drive means are engaged with said support surface as said surface is advanced along said path further into said operative postion.

4,429,780

DEVICE FOR DEPOSITING GOODS ONTO CONVEYOR BELTS OR THE LIKE

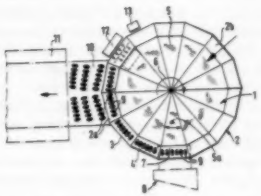
Jim Innes, Kitchener, Canada, assignor to Santrade Ltd., Lucerne, Switzerland

Filed Jul. 27, 1981, Ser. No. 287,062

Claims priority, application Fed. Rep. of Germany, Aug. 1, 1980, 3029159; Dec. 3, 1980, 3045616

Int. Cl.³ B65G *47/26*

U.S. Cl. 198—424 **16 Claims**



1. A device for transfer of piece goods onto conveyor belts or the like, particularly for pieces susceptible to deformation, made from dough-like material, wherein the premolded individual pieces are delivered to a conveyor belt and are transferred onto same by a transfer device, characterized in that the transfer device comprises a rotatable transfer table which is provided in the region of its periphery with swingably mounted transfer plates for the individual pieces, at least a part of the region of the transfer table is disposed above the conveyor belt, the transfer plates are downwardly swingable by a control device within the said region of the table, the swing axes of the transfer plates extend tangentially to the path of motion of the transfer table, and said oppositely swingable transfer plates are so arranged with respect to each other that they abut against each other with their freely swingable edges.

4,429,781

METHOD AND APPARATUS FOR SUPPLYING INDIVIDUAL ITEMS TO A CONVEYOR

Dieter Holzhäuser, Darmstadt, Fed. Rep. of Germany, assignor to Kosan Crisplant A/S, Aarhus N, Denmark

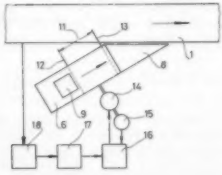
PCT No. PCT/DK80/00015, § 371 Date Nov. 10, 1980, § 102(e) Date Nov. 10, 1980, PCT Pub. No. WO80/01903, PCT Pub. Date Sep. 18, 1980

PCT Filed Mar. 7, 1980, Ser. No. 212,709

Claims priority, application Fed. Rep. of Germany, Mar. 9, 1979, 2909292

Int. Cl.³ B65G *47/68*

U.S. Cl. 198—448 **8 Claims**



1. A method of operating an apparatus for supplying individual items to a conveyor moving at an operating velocity, said apparatus having a loading device and a drive for varying the conveying speed of the loading device, comprising the steps of:

(A) delivering an item onto a conveying surface of the loading device; and

(B) accelerating said item from an initial velocity on said loading device, that has a speed component in a direction of conveyance of the conveyor which is substantially different from said operating velocity of the conveyor, to

substantially the same speed component in the direction of conveyance of the conveyor as the conveyor by a controlled adjustment of the conveying speed of the loading device in a manner in which the acceleration of the item on the conveyor does not produce overturning thereof and does not overcome the static friction between the item on the conveying surface of the loading device and said conveying surface, whereby sliding of the item is avoided.

4,429,782

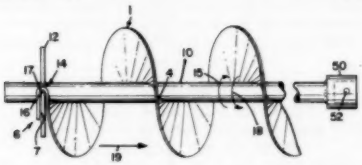
SCREW CONVEYER WITH REMOVABLE FLIGHTING

Gerald R. Pierson, Bloomington, Minn., assignor to McQuay-Perfex Inc., Minneapolis, Minn.

Filed Oct. 16, 1981, Ser. No. 312,274

Int. Cl.³ B65G *33/26*

U.S. Cl. 198—677 **8 Claims**



1. A screw conveyor comprising:

a rigid helicoidal member having a coaxial cylinder passageway;

a shaft sized to fit in said passageway;

complementary coupling means operatively associated with said helicoidal member and said shaft respectively and including a reverse bend on one end of said helicoidal member, said coupling means for engaging said shaft member and said member upon inserting said shaft in said member and rotating said shaft in one direction, and for disengaging and permitting extraction of said shaft from said member upon rotating said shaft in the other direction.

4,429,783

SCRAPER BLADE ASSEMBLY FOR CENTRAL CHAIN SCRAPER CONVEYORS

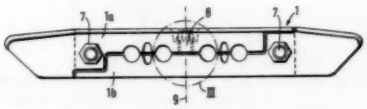
Anton Clement, Iserlohn-Letmathe, Fed. Rep. of Germany, assignor to August Thiele, Iserlohn-Kalthof, Fed. Rep. of Germany

Filed Aug. 25, 1981, Ser. No. 296,184

Claims priority, application Fed. Rep. of Germany, Oct. 4, 1980, 3038799

Int. Cl.³ B65G *19/24*

U.S. Cl. 198—731 **17 Claims**



1. A scraper blade assembly for use in a scraper chain conveyor including at least one centrally disposed chain consisting of a plurality of consecutive links, especially in a double central chain conveyor, comprising two discrete elongated scraper blade parts each substantially disposed at one side of a parting plane, said blade parts having at least two sets of mutually overlapping portions, said sets being spaced from one another longitudinally of said blade parts and at least one of said overlapping portions of each of said sets extending across said parting plane; means for bounding on each of said blade parts at least one pair of channels situated between said sets and opening onto said parting plane, the associated channels on said two blade parts complementing each other into confining openings for portions of a respective central chain link extending along said parting plane at a spacing longitudinally of said blade parts; and means for connecting said blade parts to one another, including aligned through holes in each of said sets, extending along said parting plane and transversely to the blade parts elongations, connecting bolts extending through said holes, at least one additional hole in one of said blade parts situated between said sets and extending substantially normal to said parting plane, at least one additional bolt connected to the other of said blade parts and extending across said parting plane into said additional hole, said bounding means including at least one lining on each of said blade parts, said lining being exchangeably connected with the remainder of the respective blade part, and at least one nut threaded onto said additional bolt and engaging said one blade part at said additional hole, at least one of said aligned holes in each of said sets being constituted by a slot which is elongated in the direction normal to said parting plane.

4,429,784

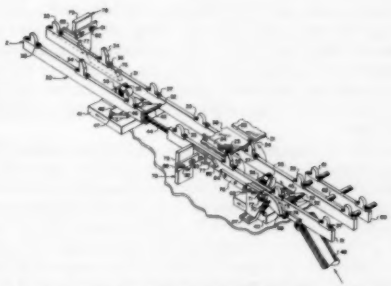
INFEED ASSEMBLY FOR RANDOM LENGTH END SHAPING MACHINE

Jeff Y. Cromeens, Mesquite, Tex., assignor to Industrial Woodworking Machine, Garland, Tex.

Filed Nov. 3, 1980, Ser. No. 203,235

Int. Cl.³ B65G *25/02*

U.S. Cl. 198—744 **24 Claims**



24. In a woodworking apparatus that has at least one end shaper, table means for supporting sticks of random length during their travel through the apparatus and an infeed assembly for advancing said sticks through said apparatus;

holddown means overlying and coacting with the table means for preventing displacement of the sticks during the shaping of their ends comprising

a pressure head assembly for holding discrete sticks of random thickness, width and length against displacement while permitting travel of said sticks therebeneath.

the pressure head assembly having a housing elongated logitudinally of the direction of travel of said sticks,

an elongate wear strip of suitable flexible material slidably mounted in the underside of the housing and depending therefrom for upright movement relative thereto,

the wear strip being articulated at spaced intervals and having upwardly opening recesses intersecting its articulations and terminating above the lower surface thereof so as to have upwardly facing bottoms, and

means confined within each recess and bearing against its bottom for resiliently urging the underlying portion of said wear strip into engagement with said sticks,

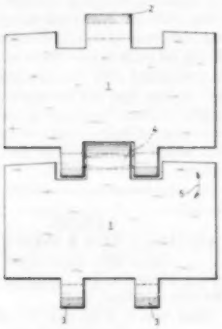
the articulations of said wear strip being formed by upwardly opening slots extending transversely entirely through said strip so as to intersect the recesses,

the lower portions of the upwardly facing slots being enlarged so as to provide the desired flexibility of said wear strip.

4,429,785
CURVE-NEGOTIATING PLATE CONVEYOR

Manfred Dango, Harkortstrasse 15, 5900 Siegen 1, Fed. Rep. of Germany

Filed Feb. 23, 1982, Ser. No. 351,732
Claims priority, application Fed. Rep. of Germany, Feb. 26, 1981, 3107127
Int. Cl.³ B65G 17/26
U.S. Cl. 198—852 6 Claims



1. A plate chain conveyor assembly comprising:

a plurality of plate members each having first and second opposite ends, said first end being provided with a single hinge eye and said second end being provided with two spaced hinge eyes, said plate members being disposed adjacent one another such that the single hinge eye of each said plate member interengages with the two spaced hinge eyes of an adjacent plate member to form a common passage;

a plurality of hinge bolts each having cylindrical ends and an approximately barrel shaped center section, said center section changing in shape from a substantially circularly shaped center portion to a substantially lens-shaped cross section towards each of said cylindrical ends, one of said hinge bolts being disposed in each said passage with the lens-shaped cross section having its larger cross sectional dimension oriented perpendicularly to the plane of the plate member having the two spaced hinge eyes through which said bolt passes.

4,429,786
INTEGRATED CONTACT LENS-MAINTENANCE KIT CARRYING APPARATUS

Stephen J. Hucal, 535 N. Michigan Ave., Chicago, Ill. 60611

Filed Sep. 30, 1982, Ser. No. 429,325
Int. Cl.³ B65D 21/02, 85/62; A45C 11/04
U.S. Cl. 206—5.1 18 Claims

1. An integrated contact lens and maintenance kit carrying apparatus for the portable facilitated storage of a user's contact lenses as well as a plurality of fluids for the maintenance of said contact lenses, said apparatus comprising:

two lens storage means for the receipt and storage of each one of a pair of contact lenses;

each of said lens storage means capable of removably receiving one each of said pair of contact lenses as well as maintaining each of said lenses in a liquid-tight storage fluid environment;

a first of said two lens storage means being operably positioned over the second of said lens storage means so as to be substantially concentrically positioned thereabove along the longitudinal axis of said apparatus;

a plurality of fluid container means operably and removably maintained along said longitudinal axis of said apparatus and operably attached to one or more of said lens storage means by container attachment means;

each of said fluid container means being juxtaposed in position to one or more successive ones of said fluid container means and removably containing fluids utilized for said user's wearing and maintenance of said contact lenses;

each of said fluid container means and said lens storage means being integrated into a substantially elongated thin cylindrical configuration to facilitate the portable carrying of same in a user's pocket and purse;

each of said fluid container means having a peripheral portion thereabout forming a substantial peripheral portion of said thin cylindrical configuration;

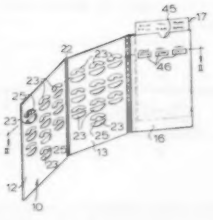
each of said fluid container means possessing alternative fluid release and containment means associated therewith; and

each of said fluid container means and lens storage means further having indicia means associated therewith to facilitate the identification of said fluids and lenses respectively contained thereby.

4,429,787
COIN CARD AND INTEGRAL INFORMATION CHART THEREFOR

H. Clifton Morse, 345 Fullerton Pkwy., Chicago, Ill. 60614

Filed Sep. 3, 1982, Ser. No. 414,827
Int. Cl.³ A45C 11/28
U.S. Cl. 206—83 9 Claims



1. An article retaining card and cooperating slide chart formed from a single piece of relatively stiff flat cardboard cut to have parallel end edges, one generally continuous side edge and an opposite interrupted side edge including two side by side disconnected article retaining cards having article carrying slots therein and foldable over said piece of cardboard to define two connected article retaining cards of substantially the same area, an accordian fold line extending along said piece of cardboard defining the backs of said article retaining cards,

said piece of cardboard also including a slide card formed integrally therewith and removable therefrom, and a double-accordian type fold line defining an expandable hinge extending along said single piece of cardboard at the margin of the innermost of said article retaining cards, the balance of said strip of cardboard beyond said article retaining cards comprising two aligned generally rectangular pieces of cardboard of substantially equal size and a hinge line intermediate the ends of said pieces of cardboard accommodating said pieces of cardboard to be folded over each other, an outer end of said two aligned pieces of cardboard including an adhesive spacer flap foldable over said end, an adhesive strip extending along one side of said flap, another adhesive strip extending along one of said pieces adjacent said expandable hinge for adhesively securing said spacer flap to said piece of cardboard to space said pieces apart to form a slide for said slide card, said slide card having indicia thereon pertinent to the articles insertible in said slots, and the outer face of said slide having windows therein enabling the viewing of said indicia on said slide card upon movement of said slide card along said slide.

4,429,788

CONTAINER FOR OIL CAN SPOUT

Dennis J. Harris, 717 W. 53rd St., Davenport, Iowa 52806

Filed Jan. 11, 1983, Ser. No. 457,297

Int. Cl.³ B65D *85/00;* **F16C** *3/14;* **F16M** *33/00;* **B65B** *3/04*

U.S. Cl. 206—349 **7 Claims**

1. For use with an oil can spout of the type having a lower can-piercing end and an upper pouring end; a multi-part container having upper and lower parts which when assembled includes a bottom, top and upright walls extending between and joined to the top and bottom, at least said bottom part being cup-like and the top providing an upper, removable closure for said bottom, said assembled parts being of such height and cross-sectional dimensions as to receive and enclose the spout lower end down and with its upper end adjacent the top of the container, spout support means rigid with the container and spaced above the bottom to provide an oil reservoir, said support means being formed to receive the lower end of the spout and oil drain means in communication with the oil reservoir and having an outlet end exteriorly of the container and removable closure means for the outlet end of the drain means.

4,429,789

SURGICAL SPONGE COUNTER

P. Brooks Puckett, Jr., Mequon, Wis., assignor to Meridian Industries, Inc., Milwaukee, Wis.

Filed Nov. 22, 1982, Ser. No. 443,167

Int. Cl.³ A61B *19/00;* **B65D** *5/44, 27/08;* **A61F** *13/00*

U.S. Cl. 206—370 **10 Claims**

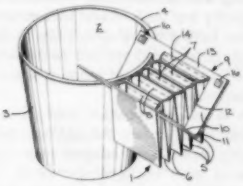
1. A surgical sponge counter for attachment to a kick bucket or the like during an operation, comprising:

(a) a plurality of closely adjacent interconnected transparent expandable bags forming a group of bags,

(b) said bags having closed bottom edges and having top mouths adapted to be openable upon expansion of said bags for receiving the sponges,

(c) means for supporting said bags in generally vertical hanging position,

(d) means securing at least some of said bags to said bag supporting means,



(e) and means on said bag supporting means for attaching the latter to a kick bucket.

4,429,790

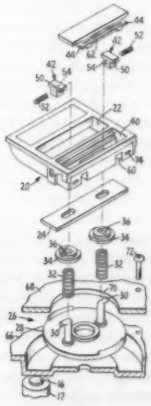
LATCH AND HANDLE ASSEMBLY FOR MAGNETIC RECORDING DISC CARTRIDGE

Dean L. Christensen, Costa Mesa, and Frank S. Ebey, Lakewood, both of Calif., assignors to Memorex Corporation, Santa Clara, Calif.

Filed Jul. 13, 1981, Ser. No. 282,521

Int. Cl.³ G11B *23/02;* **A45C** *13/26*

U.S. Cl. 206—444 **6 Claims**



1. In a magnetic recording cartridge having a recording disc contained within a first housing, with a second separably-mating housing whereby separation of said second housing is effected by lifting said recording disc axially away from engagement with a portion of said second housing which extends transversely of the disc axis;

an improved latch-handle assembly combined therewith, this assembly comprising:

lift means comprising a pair of L-shaped posts and a lift plate; and

grip means adapted to move about a pivot axis, said movement being between a first position substantially parallel to said disc and a second position relatively normal to the first position, being substantially perpendicular to the plane of said disc and generally parallel to said disc axis;

this grip means including a cavity with a pair of slots adapted to receive said lift means, a pair of spring bias means and an urging means, the urging means being adapted to move from a first position to a second position, whereby in said first position the spring bias means is held in "disengaged" condition and whereby in said second position it facilitates release of said spring bias means to be spring-urged into "engaged" condition whereat to capture said lift means;

said pair of spring bias means being thus adapted to be

spring-urged from said "disengaged" to said "engaged" condition and so adapted to so capture said lift means; and

said spring bias means being located at opposite means of said cavity and each of said bias means comprises a slide member having a hole at one end thereof and a spring at an end opposite said one end; said hole adapted to receive said L-shaped post, said spring is urged against the end of said cavity; and

wherein, in said first position, said grip means is adapted to receive said lift means through said slots;

said urging means being adapted to so urge said spring bias means to said "engaged" condition, and in a direction substantially perpendicular to said pivot axis, as well as being adapted to retain said spring bias means in said cavity.

4,429,791

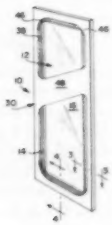
MIRROR PACKAGE AND METHOD OF FORMING

Anthony D. Ruppel; Monte Williams, and Larry Willis, all of Vincennes, Ind., assignors to Hamilton Glass Products Incorporated, Vincennes, Ind.

Filed Jun. 1, 1982, Ser. No. 383,590

Int. Cl.³ B65D *5/02, 25/00*

U.S. Cl. 206—454 **11 Claims**



1. A method of producing a package for a mirror having opposite edges and opposite ends comprising the steps of forming a flat sheet having an opening in the center and four inwardly-directed flaps, as well as four outwardly-directed flaps which ultimately define supports for opposite edges and opposite ends of said mirror, double folding said outwardly-directed flaps on opposite ends to produce at least one double ply in contiguous engagement with said sheet, folding said inwardly-directed flaps on opposite ends in overlapping relation with the double plies on opposite ends to produce rigid supports for opposite ends of said mirror.

4,429,792

MEDICATION-DISPENSING CARD

Jacob M. Machbitz, Tiburon, Calif., assignor to Medication Services, Inc., San Rafael, Calif.

Continuation-in-part of Ser. No. 301,086, Sep. 11, 1981, abandoned. This application Sep. 16, 1981, Ser. No. 302,888

Int. Cl.³ B65D *83/04, 85/56*

U.S. Cl. 206—531 **17 Claims**

1. A medication-dispensing card comprising an inner pack for storing single doses of medication prior to use and an outer cover for nonpermanently encasing the inner pack, wherein:

(a) the inner pack comprises:

a blister sheet having a plurality of pockets formed therein;

single doses of medication retained within at least some of the said pockets;

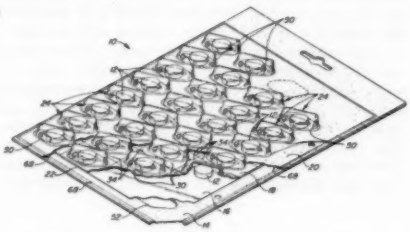
a lidding sheet laminated to one side of said blister sheet so that the pockets are sealed to protect the medication; and

means for separating one or more pockets from the remainder of the inner pack in a predetermined grid pattern so that unused doses can be recovered and recycled; and

(b) the outer cover comprises:

a front panel lying adjacent the blister sheet and having a plurality of apertures which receive the pockets therethrough; and

a back panel having substantially the same peripheral dimension as the front panel, said back panel lying



adjacent the lidding sheet and having a plurality of apertures arranged in a pattern corresponding to that of the pockets in the blister sheet, said front and back panels being free from means for detaching individual pockets and being characterized by a boss formed along the inner surface of at least one of the panels and disposed near the edge thereof, said front and back panels being attached solely by means of said boss.

4,429,793

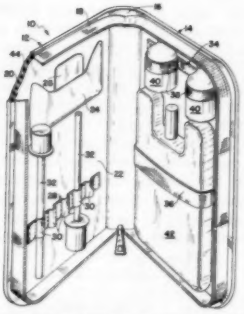
DIABETIC TRAVELING CASE

Emil G. Ehmann, Kenilworth, N.J., assignor to Ehmann Corporation, Kenilworth, N.J.

Filed May 13, 1982, Ser. No. 377,850

Int. Cl.³ A45C *11/20;* **B65D** *69/00;* **F25D** *3/08*

U.S. Cl. 206—570 **4 Claims**



1. A pocket-sized diabetic traveling case, comprising a first cover, having an inner surface, an outer surface and a layer of expanded cellular polystyrene sandwiched between said inner and outer surfaces of said first cover so as to thermally insulate said first cover; a second cover, having an inner surface, an outer surface and a layer of expanded cellular polystyrene sandwiched between said inner and outer surfaces of said second cover so as to thermally insulate said second cover; connecting means for pivotally connecting said first and second covers to each other such that said first and second covers are pivotal relative to each other between a closed position in which said first and second covers are arranged parallel to each other with said inner surfaces thereof in face-to-face relationship and an open position in which said first and second covers are pivoted away from each other; first attaching means

releaseably attaching at least two insulin containers to said inner surface of said first cover, said first attaching means including an elastic strap having a plurality of loops formed therein, each loop being sized and shaped so as to releaseably receive one of said insulin containers; second attaching means releaseably attaching a substantially flat container of freezing material to said inner surface of said first cover such that said container of freezing material is in close proximity to said insulin containers, whereby said insulin containers are refrigerated by said container of freezing material when said first and second covers are in at least said closed position; first holding means for releaseably holding a plurality of syringes, said first holding means including an elastic strap attached to said inner surface of said second cover and having a plurality of loops formed therein, each loop being sized and shaped so as to releaseably receive one of said syringes; second holding means for releaseably holding miscellaneous items, such as alcohol swabs, said second holding means including a pouch attached to said inner surface of said second cover; and a zipper attached to said first and second covers so as to releaseably maintain said first and second covers in said closed position.

4,429,794

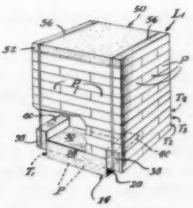
UNITIZED PACKAGING ARRANGEMENT

Jay D. Steger, 1413 Bayside La., Wheeling, Ill. 60090; Thomas G. Neitzke, 210 E. Evergreen, Mt. Prospect, Ill. 60056, and Stephen J. Gagnon, 4128 B. Cove La., Glenview, Ill. 60025

Filed May 3, 1982, Ser. No. 374,104

Int. Cl.³ B65D *19/04, 19/20*

U.S. Cl. 206—597 **19 Claims**



1. An arrangement adapted for unitizing a shipping load which is adapted for transport upon vehicle-mounted lift tines, the load comprising multiple tiers of packages in a layered array wherein the second tier includes portions overhanging laterally opposite sides of the first tier, the arrangement comprising:

a unitary support member adapted to fit beneath and support said load,

said support member including a first support portion adapted to fit beneath said first tier of packages, and a pair of second support portions respectively connected to laterally opposite edges of said first support portion by a pair of connector portions, said second support portions being adapted to respectively fit beneath said overhanging portions of said second tier and be engaged by said lift tines during transport of said load, and

said support member further including a pair of first end flap portions respectively connected to longitudinally opposite edges of said first support portion and each adapted to overlap longitudinally opposite sides of said first tier, and first and second pairs of second end flap portions, the second end flap portions of each of said first and second pairs being respectively connected to longitudinally opposite edges of a respective one of said second support portions, each of said second end flap portions being adapted to overlap a respective one of the outwardly facing sides of said overhanging portions of said second tier of packages to protect said overhanging portions of said second tier.

4,429,795

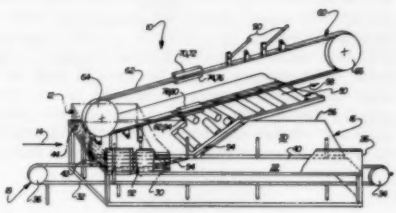
BOOK REJECT MECHANISM

Richard B. Hawkes, Peru, N.Y., assignor to Harris Graphics Corporation, Melbourne, Fla.

Filed Oct. 28, 1981, Ser. No. 315,711

Int. Cl.³ B07C *9/00;* **B65G** *37/00, 47/46*

U.S. Cl. 209—651 **10 Claims**



1. Apparatus for handling assemblages of sheet-like items comprising a raceway for receiving and supporting assemblages, a raceway conveyor having spaced raceway pins thereon projecting through said raceway for engaging trailing surfaces of assemblages positioned thereon and for pushing the assemblages along the raceway, powered conveyor means for receiving and moving assemblages thereon away from said raceway, said powered conveyor means extending at an angle to the direction of movement of said raceway conveyor, a divert conveyor for moving defective assemblages off said raceway and onto said powered conveyor means, said divert conveyor including a plurality of divert pins, means supporting said divert pins for movement between a retracted position and an extended position in which said divert pins project into the path of movement of said assemblages on said raceway, means for moving at least one of said divert pins to its extended position so that said one divert pin is adapted to engage a side of a defective assemblage, said divert conveyor extending generally parallel to said powered conveyor means, said divert pins moving in a path that intersects the path of movement of said raceway pins, and said one divert pin cooperating with a respective raceway pin to push the defective assemblage from said raceway onto said powered conveyor means.

4,429,796

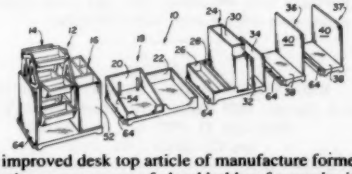
INTERCONNECTED ONE-PIECE DESK UNIT

Howard Sussman, c/o F. F. Adams Inc., 700 NW. 8th Ave., Fort Lauderdale, Fla. 33311

Filed Jan. 28, 1980, Ser. No. 116,092

Int. Cl.³ A47F *5/00*

U.S. Cl. 211—11 **4 Claims**



1. An improved desk top article of manufacture formed of a cooperating arrangement of plural holders for sundry items interconnected into a one-piece unit for use on a desk surface, each said holder comprising a base having two vertically oriented opposite sides, a compartment-forming wall supported by opposite end connections to extend lengthwise of and in a clearance position from one said opposite side so as to cooperate therewith in bounding a vertically oriented holder-connecting compartment, and said other opposite side being defined by a depending wall having notches formed therein at locations selected to align with said opposite end connections

of said compartment-forming wall, adjacent holders having operative positions in side-by-side relation with said depending wall of one said holder projected through said compartment of an other said holder until establishing contact with said desk surface such that each said holder is supported on said desk surface with said opposite sides in contact therewith and in interconnected relation with each other, each said depending wall being sufficiently sized so as to be adapted to pivot into contact with a cooperating said compartment-forming wall incident to the lifting of said holders, whereby a grouping of at least three said interconnected holders are adapted when lifted under slight pressure applied inwardly at opposite ends to retain their interconnected relation due to said established contact between said depending and compartment-forming walls and wherein said lifted holders thereby contribute to facilitated cleaning of said desk surface beneath said holders.

4,429,797

TIE CADDY

Wesley A. Collins, 18417 S. Van Ness Ave., Torrance, Calif. 90504

Filed Mar. 24, 1982, Ser. No. 361,292
Int. Cl.³ A47F *5/08*
U.S. Cl. 211—119 **5 Claims**

1. A tie-rack which comprises:
a vertical spine;
a plurality of vertically spaced lateral arm pairs extending from said spine in opposite directions from one another;
means at one end of said spine for suspending same from a fixed support, said means comprising a hook for engaging a closet clothes bar;
means for pivotally connecting said spine to said hook;
said means for connecting comprising:
said spine having a pivotal neck at said end, and said hook having a stem swivelling into said neck about an axis defining an oblique angle with said spine.

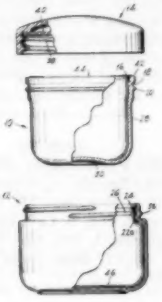
4,429,798

PROTECTED GLASS JAR WITH CLOSURE

Allan A. Borows, 1889 Palmer Ave., Larchmont, N.Y. 10538

Filed Jun. 11, 1982, Ser. No. 387,406
Int. Cl.³ B65D *8/06, 23/00*
U.S. Cl. 215—12 R **7 Claims**

1. A double-walled container for cosmetic and like substances, comprising in combination:
(a) a jar part constituted of substantially non-compressible material, having an annular side wall and a transverse bottom wall joined thereto,
(b) said jar part having an annular top sealing rim portion and shoulder means on the outer annular side surface of said rim portion,
(c) an outer jacket for and assembled to said jar part, constituted of yieldable material, said jacket having an annular side wall and a transverse bottom wall joined to said side wall,
(d) said jacket having a top rim portion on said side wall, and having shoulder means on its inner side surface engageable and cooperable with the said shoulder means of the jar part,
(e) said top rim portion of the jacket being fully exposed upwardly of the jacket and being uncovered when the jar part and jacket are assembled to each other, and said top rim portion of the jacket having sloped fastening means on its outer annular side surface for engagement by a closure cap,
(f) a turnable closure cap having a sealing liner,
(g) said sealing liner engaging the said annular top sealing



rim portion of the jar part to seal closed the contents of the latter, and
(h) said closure cap having sloped fastening means on its inner side surface, cooperable with the said sloped fastening means of said jacket to pull the closure cap closed when it is turned, and cooperable by a camming action with the sloped fastening means of said jacket to exert radially-inward pressures on the top rim portion of the latter, thereby to securely lock the rim portions of the non-compressible jar part and the yieldable jacket to each other in response to tightening of the closure cap by virtue of interaction of the said fastening means with each other in yielding and non-yielding relation respectively, whereby separation of the jacket from the jar part is minimized when the closure cap is closed.

4,429,799

BOTTLE WITH A ONE-PIECE CORKING MEANS

Efim Zaltsman, Brooklyn, N.Y., assignor to Monarch Wine Co., Inc., Brooklyn, N.Y.

Continuation-in-part of Ser. No. 223,894, Jan. 9, 1981, abandoned. This application Jun. 3, 1982, Ser. No. 384,758
Int. Cl.³ B65D *1/02, 55/16*
U.S. Cl. 215—31 **25 Claims**

25. A bottle for use with a tethered, headed cork having a flexible, elongated, folded tether connected adjacent one end to the head of the cork, said tether lying substantially within the confines of the periphery of the head of the cork, an elasto-

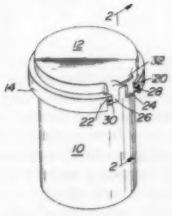
meric ring including means for connection to the tether adjacent its other end, said bottle adapted to contain pressurized, carbonated, water-based liquid contents, said bottle having a neck with a finish which includes a pair of annular flanges closely spaced together near the mouth of the bottle, the outer diameter of the flange closest to the mouth, being slightly larger than the inner diameter of the ring so that the ring can be pushed down over this flange expanding as it does so and constricting after it passes such flange and being able to be pushed manually over the next flange, the second flange having a diameter which is large enough to check downward movement of the ring, but small enough to permit the ring to be pushed manually over it.

4,429,800

CHILD SAFE CONTAINER-CLOSURE UNIT

Donald J. Greenspan, 235 Pavilion Avenue, Riverside, N.J. 08075

Filed Jun. 1, 1982, Ser. No. 383,659
Int. Cl.³ B65D *55/02*
U.S. Cl. 215—216 **19 Claims**



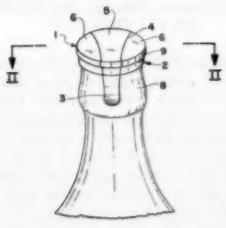
1. A child safe container-closure unit comprising
a container for holding items, said container capable of being opened at least at one end thereof,
a releasable cover for engagement with an opening at least at one end of said container, said cover having fastening means for attaching said cover to said container, said fastening means including releasable latch means comprised of at least two latches separated by a predetermined distance so that the latch means is releasable by an adult finger, but is reasonably inoperable by at least one child's size finger.

4,429,801

TEAR-OFF CAP FOR CLOSING BOTTLES

Luigi Taragna, Aprilia, Italy, assignor to American Flange & Manufacturing Co. Inc., Linden, N.J.

Filed Mar. 16, 1982, Ser. No. 358,538
Int. Cl.³ B65D *41/42*
U.S. Cl. 215—254 **4 Claims**



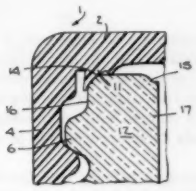
1. A light metal tear-off cap for closing bottles comprising a circumferential flap and a flat disc-shaped part, a tear-off band crosses the disc-shaped part and circumferential flap and extends beyond the same in a pullout tongue, a disc-shaped gasket fastened only partially to the bottom surface of the metal disc-shaped part characterized in that said disc-shaped gasket is fastened to said metal disc-shaped part only in zones disposed laterally of and outside the tear-off band.

4,429,802

LINERLESS CLOSURE CAP

Walter J. Marks, Mississauga, Canada, assignor to Anchor Hocking Corporation, Lancaster, Ohio

Filed May 28, 1982, Ser. No. 383,285
Int. Cl.³ B65D *41/04*
U.S. Cl. 215—344 **6 Claims**



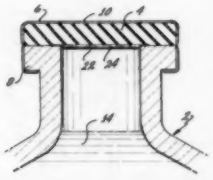
1. In a one-piece molded closure cap having a cover and a depending skirt with container engaging means on the skirt for engaging cap engaging means on the container rim finish below a closure engaging edge on the outside of the rim, the improvement comprising a circular sealing portion on the underside of the cap cover having a flared and concave curved inner sealing surface for sealing engagement with the container rim outer edge and having a shorter downwardly projecting sealing ring positioned intermediate the edges of said rim, said circular sealing portion comprising a downwardly projecting sealing ring having a generally triangular cross-section with the flared and curved surface being the hypotenuse of the triangle.

4,429,803

BROKEN SEAL DETECTOR

Ida M. Butterfield, Santa Maria, Calif., assignor to Butterfield Group, Santa Maria, Calif.

Filed Mar. 31, 1982, Ser. No. 363,925
Int. Cl.³ B65D *51/24*
U.S. Cl. 215—366 **2 Claims**



1. An improvement for use in a container of the type having a mouth sealed by a closure that includes a rubber disc that in normal use is penetrated by a hypodermic needle to permit the fluid in the container to be withdrawn by aspiration, said improvement comprising:
a blister-like sac spanning the entire mouth of the container and containing a colorant, so that when the blister-like sac is penetrated by a hypodermic needle, some of the colorant will be released into the fluid in the container imparting a color to the fluid to indicate that the container has been broken into.

4,429,804

RE-SEALER FOR TAB-RETAINING POP-TOP CANS

Gerald F. Pease, 10622 Prospect Ave., Santee, Calif. 92071

Filed Jun. 9, 1982, Ser. No. 386,545
Int. Cl.³ B65D 45/00
U.S. Cl. 220—247 3 Claims

1. A re-sealer for a beverage can of the type in which the opener tab remains with the can alongside the pouring hole in the lid after opening, said re-sealer comprising:

(a) a cover body defining a continuous sealing lip dimensioned to encircle both said pouring hole and said tab;

(b) said body defining a cavity to provide clearance for said tab;

(c) a stem with a laterally extended foot at the bottom for extnending into said hole and under a portion of said lid alongside said opening for a positive engagement thereof;

(d) said stem being mounted eccentrically in said body adjacent one edge of said cavity and being rotatable about its axis to swing said foot into and out of general alignment with said hole for removal and insertion of said foot through said hole, and for rotating said foot sideways to clamp under said lid; and

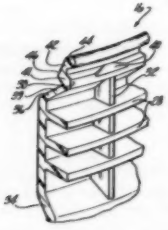
(e) an actuator lever operatively connected to the upper end of said stem to selectably draw said foot up against said lid, or down free thereof.

4,429,805

CONTAINER CONSTRUCTION

Ilija Letica, Oxford, Mich., assignor to Letica Corporation, Rochester, Mich.

Continuation-in-part of Ser. No. 235,245, Feb. 17, 1981, Pat. No. 4,349,119, which is a continuation-in-part of Ser. No. 169,330, Jul. 16, 1980, Pat. No. 4,293,080. This application May 10, 1982, Ser. No. 376,312
Int. Cl.³ B65D 41/16, 41/18
U.S. Cl. 220—306 8 Claims



1. A plastic container, comprising:

a base;

a generally cylindrical sidewall extending upwardly from said base and defining an open top of said container opposite of said base,

said sidewall including a section therein radially inset from said sidewall and adjacent said open top; and

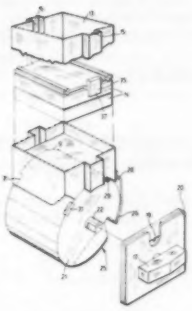
means within said inset section for stiffening said inset section in a direction essentially parallel to the longitudinal axis of said container.

4,429,806

ROTATING DRUM DISPENSING MACHINE

Joseph W. Schwarzli, Stouffville, Canada, assignor to Twin-Cee Limited, Georgetown, Canada

Filed Sep. 1, 1981, Ser. No. 298,478
Int. Cl.³ B65H 7/18
U.S. Cl. 221—20 2 Claims



1. A coin operated dispensing device comprising a rotatable operating member provided with a coin insert for receiving a coin to release said operating member, said coin insert being moveable to and away from a coin loading position with rotation of said operating member, a rotatable drum adapted for rotation with said operating member to dispense articles to a dispensing opening in said device, a chute for loading the articles in said device and for feeding the articles to said rotatable drum which is located between said dispensing opening the said chute for blocking said chute against pilfering through said dispensing opening in all positions of rotation of said drum, said chute extending generally vertically in said dispensing device and including a locking member adapted to slide downwardly in said chute as the articles are fed therefrom, said chute being provided with two outer channel regions, one to either side of said chute, said locking member being provided with a pair of lugs adapted to slide downwardly in said channel regions and said drum being provided with a pair of slots for engaging said pair of lugs such that said locking member moves to a locking position for locking both said drum and said operating member against rotation when said chute has been emptied and said coin insert being held away from said coin loading position to prevent insertion of coins in said dispensing device when said chute is empty.

4,429,807

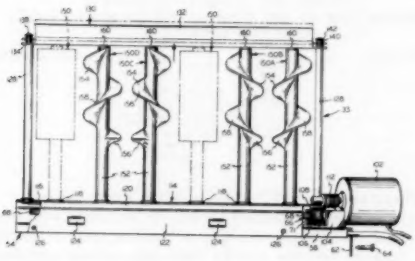
ADJUSTABLE DISPENSING MECHANISM FOR VENDING MACHINE

John A. Enders, Simsbury, Conn., assignor to Choice-Vend Industries, Inc., Windsor Locks, Conn.

Filed Aug. 4, 1981, Ser. No. 290,090
Int. Cl.³ G07F 11/36
U.S. Cl. 221—75 11 Claims

1. A mechanism for dispensing generally cylindrical arcitles from a plurality of stacks contained in a vending machine, comprising: support means, including a base; a plurality of gear members mounted in meshing engagement with one another on said base for simultaneous rotation about parallel, generally rectilinearly aligned axes; a plurality of helical carriers vertically mounted on said support means and adapted to support the articles generally horizontally within their convolutions, each of said carriers being aligned on the axis of rotation of one of said gear members and having an upper helix portion and a lower helix portion, said upper helix portion being adapted to receive the articles and said lower helix portion being adapted to permit the release thereof at at least one rotational position of said carrier; means for affixing said carriers to said gear

members for conjoint, coaxial rotation, said means selectively disengageably affixing at least one of said carriers to an associated one of said gear members in any of a plurality of angularly displaced relative positions; a motor operatively connected to drive said gear members; and a vend limit switch operatively connected to at least of one of said gear members to cause deenergization of said motor, depending upon the position thereof, each time that the lower helix portion of any of said carriers is in one of the article-release rotational positions thereof, said one gear member having a cam member disengageably mounted thereon with cam elements extending radially outwardly from the axis thereof for operating said limit switch, said cam member being divided at a plane perpendicular to the axis thereof into first and second portions, the number of cam elements presented by said first portion being different from that presented by said second portion, so that the position of mounting upon said one gear member may be reversed to change the number of cam elements effectively presented to said switch, depending upon the mode of operation, whereby the articles, withdrawn from the stacks and progressively lowered within the convolutions of said carriers during rotation thereof, can be discharged in a predetermined sequence depending upon the relationship between said lower helix portions of said carriers, and whereby the timing of discharge can be altered by changing the relative angular position of affixation of said one carrier to said one gear member, and by appropriate mounting of said cam member on said one gear member.



4,429,808

DUAL DRIVE ROTARY FEEDER

Myron L. Doty, Greenwood, Ind., assignor to Moorfeed Corporation, Indianapolis, Ind.

Filed Dec. 17, 1981, Ser. No. 331,624

Int. Cl.³ B65H *3/42*

U.S. Cl. 221—167 **8 Claims**

1. An apparatus for feeding articles in serial order comprising:

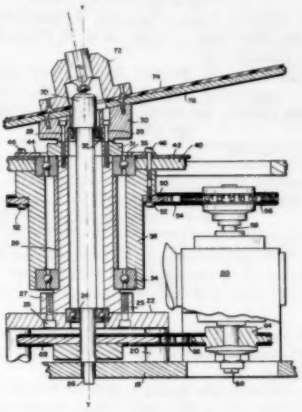
a base,

a substantially horizontal, annular surface rotatably movable with respect to the base about an axis perpendicular to the base,

a cylindrical wall subtending from the inner periphery of the annular surface and rotatably movable therewith,

an inclined support surface fixed stationary relative to the base, the point of intersection of the support surface with the axis being positioned substantially midway between the plane of the annular surface and the lowest extent of the cylindrical wall, and

a disc mounted for rotational movement on the support surface substantially concentric with the axis, the periphery of the disc being immediately adjacent to the cylindrical wall, the disc being inclined by the support surface



such that the uppermost portion of the periphery of the disc is immediately adjacent the annular surface.

4,429,809

DEVICE FOR THE METERED RELEASE OF AN ACTIVE INGREDIENT

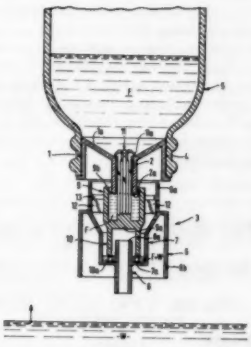
Jacques Bousgarbies, Poitiers, France, assignor to Airwick Industries, Inc., Carlstadt, N.J.

Filed Apr. 13, 1981, Ser. No. 253,972

Claims priority, application Switzerland, Apr. 25, 1980, 3208/80

Int. Cl.³ E03D *9/02*

U.S. Cl. 222—67 **17 Claims**



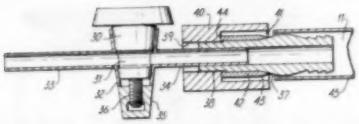
1. A device for the metered release of a liquid active ingredient from a stock container into a surrounding liquid, the level of which rises and falls from time to time, having a level-controlled metering unit (2, 9, 3) with a movable float (3) guided thereon, said unit communicating with the interior (5) of the container and releasing a defined quantity of active ingredient when said float (3) is raised, and further comprising a release control unit (7, 8, 10) having a movable collecting chamber (7, 6a) positioned to collect said defined quantity of released active ingredient and an overflow syphon positioned in said chamber for transferring said defined quantity of active ingredient into the surrounding liquid.

4,429,810

PLASTIC POUCH, AND STORING AND DISPENSING METHOD USING SAME

Gerald Hampel, Lugano-Paradiso, Switzerland, and Giorgio Mugnai, Rho, Italy, assignors to W. R. Grace & Co., Cryovac Div., Duncan, S.C.

Division of Ser. No. 229,437, Jan. 28, 1981, abandoned. This application Aug. 23, 1982, Ser. No. 410,213
Claims priority, application Italy, Feb. 7, 1980, 19772 A/80
Int. Cl.³ B65D *1/32*
U.S. Cl. 222—107 **1 Claim**



1. A valve and pouch combination wherein said valve is adapted to cooperate with and dispense liquid from said pouch, comprising:

(a) a hermetically sealed pouch of flexible, thermoplastic material having first and second closed ends and a main container portion comprising:

(i) a first thermal seal which is adjacent to and substantially parallel to said first end;

(ii) a pair of parallel partial seal lines sealing the second end of said pouch;

(iii) a passage defining seal line joining the ends of said pair of parallel partial seal lines said passage communicating with said main container portion;

(iv) a liquid in said main container portion of the pouch; and,

(v) said passageway being adapted to receive a biconical mounting portion of a dispensing valve when liquid is being dispensed from the pouch; and,

(b) valve means adapted to co-operate with said pouch and allow discharge of liquid from said pouch comprising;

(i) a valve portion insertable into said passageway to be held there solely by adhesion to the pouch material bounding said passageway;

(ii) said portion of said valve which is insertable in said passageway being biconical; and,

(iii) said valve including inner and outer spaced cylindrical surfaces defining therebetween an annular gap to receive the pouch material bounding said passageway and further including outwardly spreadable clamping means for diminishing the radial extent of said annular gap to clamp said valve to the pouch material bounding the passageway.

4,429,811

LIQUID STORAGE CONTAINER ASSEMBLY AND DECANTER

Delbert C. Bakeman, 15520 Hamner Dr., Los Angeles, Calif. 90077

Filed Jan. 7, 1982, Ser. No. 337,565
Int. Cl.³ B05B *11/02*
U.S. Cl. 222—159 **4 Claims**

1. A liquid storage container assembly and decanter comprising:

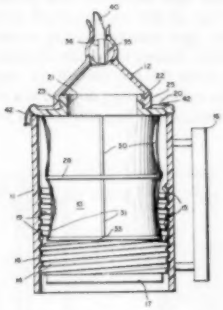
(a) a collpsible container of generally cylindrical form and consisting of a flexible and stain-resistant material for holding a liquid;

(b) a cylindrical outer casing for enclosing said container, said casing having an internal screw thread and having an internal coating of high reflectivity and low emissivity thermal properties;

(c) a piston having an outer screw thread meshing with said internal screw thread, whereby said coating and the air space between said container, casing, and piston tend to maintain the temperature of a liquid in said container, said piston having a handle for rotating it to compress or release said container, thereby to substantially exclude air from said container;

(d) a transparent pouring neck having means for removably attaching it to said container;

(e) a valve disposed in said pouring neck for opening and closing the space within said container;



(f) said pouring neck having a pouring spout; and

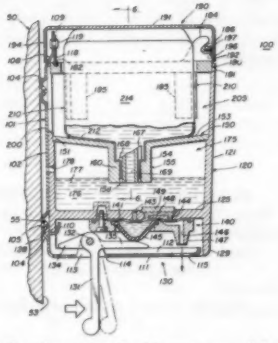
(g) said container being provided on its outside with relatively stiff, spring-like and deformable stays extending between said disk and the lower edge of said container, thereby to tend to restore said container to its uncompressed state when said piston is moved downwardly.

4,429,812

SOAP DISPENSING SYSTEM

Robert L. Steiner, and Randel P. Smith, both of Chicago, Ill., assignors to Steiner Corporation, Salt Lake City, Utah

Filed Apr. 16, 1981, Ser. No. 254,940
Int. Cl.³ B67D *5/06*
U.S. Cl. 222—181 **26 Claims**



1. A system for dispensing liquid soap comprising a closed wall structure defining a container, partition means separating said container into a lower liquid soap reservoir and an upper refill compartment, dispensing means carried by said container for dispensing liquid soap from said reservoir, a refill aperture in said partition means providing communication between said reservoir and said refill compartment, a refill cartridge containing liquid soap and having an outlet and being imperforate except at the outlet thereof, and slot and key mechanism carried by said refill cartridge and said container for maintaining said cartridge in a predetermined refill configuration and in communication with said refill aperture, a drain slot in said upper refill compartment to cause bulk liquid soap poured

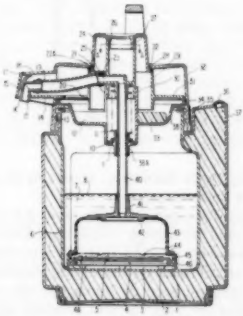
thereinto to flow therefrom, and a drain opening in said lower liquid soap reservoir vertically spaced above the cartridge outlet when said cartridge is in the refill configuration thereof, said refill cartridge being removably enclosed within said refill compartment in a refill configuration with said outlet disposed for cooperation with said refill aperture to permit flow of liquid soap from said refill cartridge to said reservoir thereby to refill said reservoir.

4,429,813

MECHANICAL DEVICE TO TRANSFER LIQUIDS FROM CONTAINERS

Elias M. De Freitas, Porto Alegre, Brazil, assignor to Termolar S/A, Porto Alegre, Brazil

Filed Jan. 15, 1982, Ser. No. 339,547
Claims priority, application Brazil, Jan. 23, 1981, 8100430
Int. Cl.³ B67D *5/42, 5/50*
U.S. Cl. 222—207 **15 Claims**



1. A mechanical device to transfer liquids from containers which, when fitted into a container, does not require its inclination, and does not depend on its air tightness and volume, comprising a pump including a flexible bell shaped member (43), with an upper orifice, and a widened ring-like area in its lower extremity, forming a housing (45) where a rigid veined disc is located forming a disc-valve (4), said housing being provided, in its upper internal edge, with small prominences (44) and the lower edge, which limits the opening of the mouth of the bell shaped member, and ends in a small inner vertical projection forming a continuous rim (46); a liquids transference pipe (40) connected to the upper orifice of the bell shaped member, and when a vertical manual compression effort is made, the bell shaped member is deformed, compressing the liquid inside it, thereby pressing the disc-valve (4) against the continuous rim (46) of the housing (45), thereby sealing of the mouth of the bell shaped member and forcing the liquid to flow out through the transference pipe (40); and the prominences (44) of the housing limit the upward movement of the disc-valve, leaving an empty space for the inflow of the liquid in the bell shaped member (43) when it returns to its original shape.

4,429,814

AEROSOL CONTAINER FOR DISPENSING THERMOSETTING POLYURETHANE FOAM

Frank Scotti, 450 Indian Rd., Wayne, N.J. 07470, and Edward H. Page, 1021 Hillcrest Rd., Ridgewood, N.J. 07450

Filed Jun. 25, 1982, Ser. No. 392,178
Int. Cl.³ B65D *83/14*
U.S. Cl. 222—402.13 **14 Claims**

1. In an aerosol container having an open top end, a closed bottom end and a cap member closing said top end, the improvement of an assembly for dispensing thermosetting resins comprising:

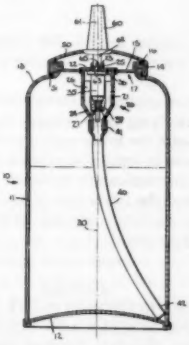
an upstanding valve shell mounted on and penetrating said cap member said valve shell having a top wall provided with an aperture and a lower end having an opening;

a spring biased fluid impervious valve plunger member disposed in said valve shell substantially coaxially aligned with said aperture and normally biased upwardly in sealing engagement with said top wall for preventing fluid flow through said aperture;

a cover member fabricated from flexible resilient material detachably mounted to said top end of said container;

a dispensing member mounted on and penetrating said cover member including a downwardly depending first conduit member substantially coaxially aligned with said aperture wherein said first conduit member normally terminates above said valve shell top wall;

a second conduit member depending from said valve shell lower end and terminating near said bottom end of said container for providing a fluid passage from said bottom end, through said opening and into said valve shell;



wherein providing a downward force on said resilient cover member causes said first conduit member to penetrate said aperture and engage and urge downward said valve plunger member and releasing said downward force results in said resilient cover member urging said first conduit member upward to said normal position wherein said first conduit member terminates above said valve shell top wall permitting said spring biased valve plunger member to return to said normally biased sealing engagement with said valve shell top wall;

wherein said dispensing member including said first conduit member, said valve shell, said second conduit member, and said valve plunger member are fabricated from a plastic material having a moisture content of less than about 0.6 percent based on the weight of said plastic at 100% humidity at 25° C. at standard atmosphere pressure; and

wherein said container has disposed therein a thermosetting resin and a propellant.

4,429,815

ROTATING DISPENSER CAP

Sidney M. Libit, 441 Lakeside Ter., Glencoe, Ill. 60022

Filed Nov. 12, 1981, Ser. No. 320,735
Int. Cl.³ B67D *3/00*
U.S. Cl. 222—452 **21 Claims**

1. A dispenser for granular solids material comprising:

a container having an orifice defined by an externally threaded neck portion,

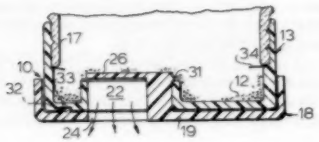
a cap body having a cap surface disposed across said orifice and an internally threaded peripheral wall threadably engaged with said neck portion,

a peripheral wall formed on said cap surface defining a keyhole opening having an open upper end facing exterior

of said cap surface and an open lower end exposed in and facing in direct communication with the interior of said container,

a generally solid metering disk overlying said cap surface and having a shaft member supported in a semi-circular segment of said keyhole opening for rotation of said disk relative to said cap body.

a collection chamber defined by the remainder of said keyhole opening,



a discharge opening in said disk disposed to overlie said collection chamber upon selective rotation of said disk, and

a valve means connected for rotation with said shaft member directly underlying said discharge opening, and disposed spaced beneath the lower end of said collection chamber so as not to be in contiguous relation therewith, for blocking flow communication between the interior of said container and the lower end of said collection chamber when said discharge opening overlies said collection chamber upper end.

4,429,816

UNION FOR PROVIDING INERT GAS BETWEEN TEEMING NOZZLE AND POURING TUBE

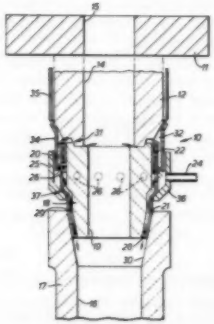
Anthony Thrower, Dronfield, England, assignor to USS Engineers and Consultants, Inc., Pittsburgh, Pa.

Filed Feb. 24, 1982, Ser. No. 351,822

Claims priority, application United Kingdom, Mar. 3, 1981, 8106587

Int. Cl.³ B22D *41/08*

U.S. Cl. 222—603 **10 Claims**



9. Apparatus for use in submerged pouring of molten metals, comprising a nozzle leading downstream to an elongated submerged pouring tube, the nozzle having, at least at its downstream end, a metal jacket spaced therefrom to define an annular manifold space, a gas supply pipe communicating with said manifold space, and gas discharge orifice means at the said end of the nozzle, the nozzle and its metal jacket forming a gas-tight joint with the upstream end of the pouring tube, and said orifice means being arranged to eject gas fed into the manifold space in a direction substantially along the inner wall of the pouring tube.

4,429,817

TREATING AGENT SHOOTING APPARATUS OF LAUNDRY MACHINE

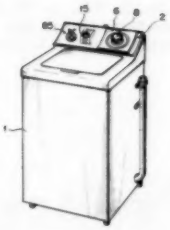
Yoshio Ikeda, Aichi, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Apr. 2, 1981, Ser. No. 250,144

Claims priority, application Japan, Apr. 3, 1980, 55-44817; Apr. 30, 1980, 55-57194

Int. Cl.³ D06F *39/02*

U.S. Cl. 222—652 **14 Claims**



1. A treating agent dispensing apparatus of a laundry machine having a tank comprising:

storage means for storing an amount of a treating agent;

a treating agent dispensing vessel rockable between a dispensing stand-by position wherein a treating agent is reservably received and a dispensing position wherein the reserved treating agent is discharged into the tank;

driving means for rocking said treating agent dispensing vessel from said dispensing stand-by position to said dispensing position;

a control member movable between an original position, a treating agent feed position, and a dispensing vessel return position intermediate said original and said feed positions, said control member including a control lever rockable around a horizontal axis, said conrol lever rocking to engage said treating agent dispensing vessel as said control member is moved to said treating agent feed position, thereby responsively rocking said dispensing vessel to said dispensing stand-by position;

interlocking means operatively connected with said control member to be moved thereby when said control member is moved from said original position to said return position for rocking said treating agent dispensing vessel and returning said dispensing vessel from said dispensing position to said dispensing stand-by position; and

treating agent feeding means operatively connected with said control member to be moved thereby when said control member is moved from said vessel return position to said treating agent feed position for feeding a predetermined amount of treating agent from said treating agent storage means into said treating agent dispensing vessel while said dispensing vessel is in said dispensing stand-by position.

4,429,818

CARRIER RACKS FOR BICYCLES

Thomas C. Patterson, Westport, and David L. Campbell, Norwalk, both of Conn., assignors to Cannondale Corporation, Georgetown, Conn.

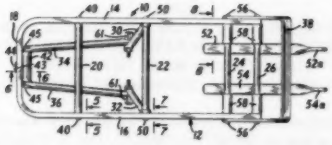
Filed Oct. 2, 1981, Ser. No. 307,804

Int. Cl.³ B62J *7/04*

U.S. Cl. 224—39 **10 Claims**

1. A rear carrier rack for bicycles comprising a platform defined by a peripheral frame having at least two laterally

spaced-apart side portions and a rear portion, a main strut extending generally downwardly from each side portion of the frame and adapted to be attached to a bicycle at an attachment location in the area of the rear axle to support the platform over the rear wheel, a pair of rear struts connected to the rear portion of the frame at locations substantial distances inwardly from the side portions and extending downwardly, forwardly and outwardly for attachment to the frame at said attachment locations, a pair of laterally spaced-apart seat stay connecting



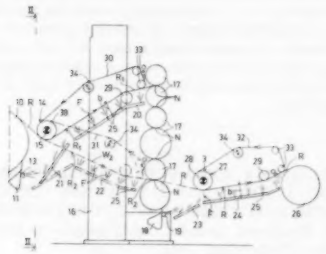
bars adjustably attached to the frame for adjustment longitudinally of the frame, each connecting bar being a band of metal having a rear portion oriented with its major surfaces flatwise to the platform, said rear portion extending substantially the entire distance from the platform to a distal front end portion for maximum lateral rigidity, said distal front end portion being twisted about 90° generally about the longitudinal axis of the band providing an orientation of said distal front end portion that is generally flatwise to the seat stays for connection to a seat stay.

4,429,819

APPARATUS FOR LEADING THE TAIL OF WEB OF PAPER

Jaakko Palovaara, Muurame, Finland, assignor to Valmet Oy, Finland

Filed Aug. 28, 1981, Ser. No. 297,350
Claims priority, application Finland, Sep. 3, 1980, 802772
Int. Cl.³ B65H *17/28*
U.S. Cl. 226—95 **1 Claim**



1. Apparatus for leading the tail of a web of paper forward, before widening of said web, to cooperate with different parts of a paper machine, said paper machine including an axle and a reversing roller mounted on said axle and having a predetermined diameter, said apparatus comprising

a fabric loop driven by said reversing roller, said fabric loop having a specific running section;

an air blower positioned at a distance from said fabric loop adjacent said specific running section thereof, said air blower having jet means for directing a plurality of air jets toward said tail of said web whereby said tail is supported by said fabric loop and transferred forward thereby;

an additional roller mounted on said axle and having a diameter equal to that of said reversing roller, said additional roller guiding said fabric loop; and

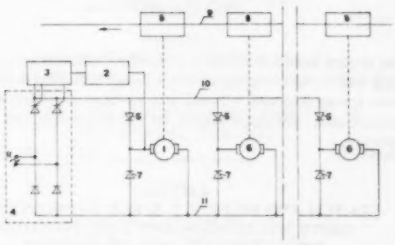
a clutch in operative engagement between said reversing roller and said additional roller for driving said additional roller and said fabric loop at the operating speed of said paper machine when said clutch is closed, and for permitting said additional roller and said fabric loop to remain idle when said clutch is open.

4,429,820

APPARATUS FOR FEEDING WIRE OVER LARGE DISTANCES

Angel S. Angelov, and Dimiter A. Ivanov, both of Sofia, Bulgaria, assignors to Institute Po Technicheska Kibernetika, Sofia, Bulgaria

Filed Apr. 30, 1982, Ser. No. 373,536
Claims priority, application Bulgaria, Apr. 30, 1981, 51904
Int. Cl.³ B65H *51/02*
U.S. Cl. 226—108 **3 Claims**



1. Apparatus for feeding wire over large distances from a source of wire supply to a work station, comprising first and second tandemly arranged wire-feeding mechanisms, the first wire-feeding mechanism being disposed adjacent the work station and the second wire-feeding mechanism being disposed nearer the source of wire supply than the first wire-feeding mechanism, a first D.C. motor drivingly connected to the first wire-feeding mechanism, said first motor having two terminals, a second D.C. motor drivingly connected to the second wire-feeding mechanism, said second motor having two terminals, a source of alternating current connected to a pulse governed thyrister rectifier having a first output terminal connected to a first output conductor and a second output terminal connected to a second output conductor, the first terminal of each of said first and second motors being connected in parallel to the first output conductor through a respective separating diode and to the second output conductor through a back-polarizing diode, the second terminal of each of said first and second motors being directly connected in parallel to the second output conductor, the first terminal of the first motor being connected through a speed stablizer to a pulse generator connected to the thyrister rectifier so as to transmit ignition pulses thereto.

4,429,821

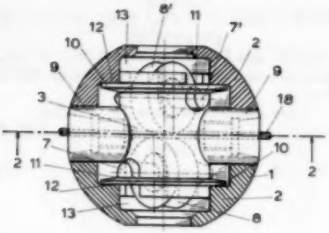
WIRE FEEDING MECHANISM

Jivko Y. Jelezov, and Todor D. Bogdanov, both of Sofia, Bulgaria, assignors to DSO "IZOT", Sofia, Bulgaria

Filed Apr. 30, 1982, Ser. No. 373,540
Claims priority, application Bulgaria, Apr. 30, 1981, 51 910
Int. Cl.³ B65H *51/04, 51/32*
U.S. Cl. 226—181 **4 Claims**

1. In wire-feeding mechanism including a housing containing rollers freely running around axles disposed at an angle with respect to each other and crossing the wire being fed by the mechanism, the housing and the rollers rotating about the wire and the rollers traveling in helical directions about the wire, the axles being mounted in a support and guiding unit, and thrust transmitting units mounted upon the housing for thrusting the rollers in the support and guiding unit toward each other and into forcible engagement with the wire, the improvement wherein the housing is spherical and presents the

cavity therewithin in which the support and guiding unit is disposed, and the support and guiding unit for the rollers is shaped as one body having oppositely directed cylindrical end portions projecting from a central hub, and seats provided in



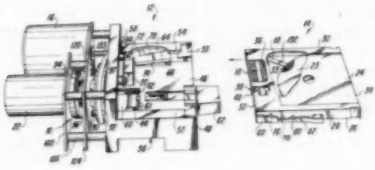
the central hub for the axles of the rollers, each thrust transmitting unit for thrusting the rollers together including at least one disc spring disposed between flat portions provided at each end of each axle and a respective flat supporting seat on the housing.

4,429,822

CLUTCH AND MULTIPLE SPEED CAPSTAN TAPE DRIVE MECHANISM AND TAPE POSITION INDICATOR FOR TAPE TRANSPORT

Arthur Dyck, Abbotsford, Canada, assignor to Gunstream Industries, Inc., Denver, Colo.

Filed Jul. 13, 1981, Ser. No. 282,811
Int. Cl.³ B65H *17/22, 17/00*
U.S. Cl. 226—188 **14 Claims**



1. In a transport apparatus for recording tape having a driven rotationally mounted tape drive capstan for advancing the tape and a pinch roller for firmly engaging the tape between the tape drive capstan and the pinch roller and motor means for rotating the tape drive capstan, an improvement comprising, in combination:

rotor means operatively connected to rotate with said tape drive capstan and to rotate said tape drive capstan;

flywheel means rotationally positioned coaxially with said rotor means and operatively connected with said motor means to be rotated at a first predetermined rotational rate;

at least one detent cam operatively pivotably connected to said flywheel means and operative from centrifugal force at the first predetermined rotational rate of said flywheel means to engage said rotor means and rotate said rotor means in conjunction with said flywheel means upon the rotational axis of the tape drive capstan being no greater than the first predetermined rotational rate;

a drive element operatively connected to rotate said tape drive capstan;

a high speed driver element rotationally positioned on said transport apparatus and operatively connected with said motor means to be rotated at a second predetermined rotational rate, the second predetermined rotational rate being substantially greater than the first predetermined rotational rate; and

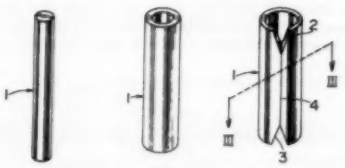
at least one cam element pivotably connected to the high speed driver element and operative from centrifugal force at rotational rates of the high speed driver element greater than the first predetermined rotational rate and at least equal to the second predetermined rotational rate to engage said drive element and rotate said drive element in conjunction with said high speed driver element.

4,429,823

TAPE GUIDE MEANS FOR RECORDING AND/OR REPRODUCING APPARATUS AND METHOD OF MANUFACTURING THE SAME

Yozaburo Umehara, 2-8-6, Shakujiimachi, Nerima-ku, Tokyo, Japan

Continuation of Ser. No. 76,827, Sep. 19, 1979, abandoned, which is a division of Ser. No. 940,198, Sep. 7, 1978, Pat. No. 4,228,940. This application Dec. 28, 1981, Ser. No. 334,472
Claims priority, application Japan, Sep. 14, 1977, 52-124344; Mar. 3, 1978, 53-24344
Int. Cl.³ B65H *23/04;* **G03B** *1/48*
U.S. Cl. 226—196 **2 Claims**



1. A tape cassette comprising a cassette case, a reel disposed therein, a tape fed from said reel and a cylindrical tape guide for guiding said tape; said cylindrical tape guide being provided with a surface layer formed by a hard chromium plating and comprising (a) a non-magnetic austenitic stainless steel upon which said hard chromium surface layer is formed, (b) a post extending from said cassette case, and (c) a projection extending from said post wherein said cylindrical tape guide includes a groove in at least one end thereof which is fitted to said projection.

4,429,824

DELTA-ALPHA BOND/SUPERPLASTIC FORMING METHOD OF FABRICATING TITANIUM STRUCTURES AND THE STRUCTURES RESULTING THEREFROM

James R. Woodward, La Jolla, Calif., assignor to Rohr Industries, Inc., Chula Vista, Calif.

Filed Sep. 17, 1981, Ser. No. 303,054
Int. Cl.³ B23K *31/02*
U.S. Cl. 228—157 **15 Claims**

1. Method of manufacturing structures from sheets of material with superplasticity characteristics comprising the steps of:

placing at least two overlapping sheets of said material between an inner and outer mandrel tool, said inner mandrel tool having a greater coefficient of thermal expansion than said outer mandrel tool;

placing forming shims between one of said mandrel tools and the adjacent sheet at locations where said sheets of material are overlapping and to be joined by diffusion bonding;

sealing the sheets of material from the atmosphere;

applying inert gas under pressure between said sheets when the sealing of the sheets of material from the atmosphere is complete to provide separation of sheets at regions not sandwiched by said shims, and

elevating said temperature sufficiently to render said sheets of material to a state of superplasticity to cause said inner

mandrel tool to expand toward said outer mandrel tool compressing said sheet material therebetween and causing the contacting surface of said sheets of material to bond together by diffusion means, said gas pressure being sufficient to cause said sheet material to form into the voids between said tooling shims and said mandrel tools.

8. A system in which flat mandrels sandwich at least two overlapping superplastic material sheets with intervening forming shims placed in locations of overlap to be diffusion bonded together, the mandrels and assemblage being secured

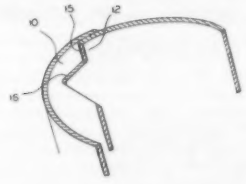
together by low thermally expanding refractory metal bolts which upon heating clamp the assemblage with a pressure which causes diffusion bonding of the areas compressed by the shims and other areas being pressurized by an inert gas to cause superplastic forming of the metals into the cavity caused by the mandrels when the temperature of the assemblage is suitably elevated, said inert gas being admitted by a small tube placed between said material sheets at their outer edges and sealed thereto by the differential in thermal expansion between said bolts and said mandrel.

4,429,825

LEAK RESISTANT CLOSURE

Michael A. Kipp, Phoenixville, Pa., assignor to Container Corporation of America, Chicago, Ill.

Filed Sep. 7, 1982, Ser. No. 415,184
Int. Cl.³ B65D *3/00*
U.S. Cl. 229—1.5 B **1 Claim**



1. A leak-resistant closure arrangement for a single lap container and lid, comprising:

(a) a container body having a wall formed from a single ply of flexible sheet material, such as paperboard, which is formed into a tubular structure with outer and inner end portions secured to each other in overlapping relation;

(b) said inner end portion having an extension with a recess at the upper corner thereof and presenting, adjacent said recess, an upwardly facing shoulder surface, said outer end portion overlapping said recess and said extension throughout its entire length;

(c) a plug-type lid having a round center section and an integral, annular rim section including:

(i) a generally cylindrical inner flange extending upwardly from the outer periphery of said center section;

(ii) a generally cylindrical outer flange concentric with but spaced radially outward from said inner flange;

(iii) a relatively narrow upper flange interconnecting upper edges of said inner and outer flanges and defining therewith an annular channel for receiving an upper end portion of said container body wall;

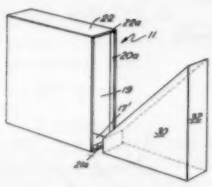
(d) the height of said lid inner flange being substantially equal to the depth of said body wall recess, so that when said lid center section is inserted into the upper end of said container and an upper end portion of said container body wall is received within said lid rim channel, said container body wall ledge surface will be positioned immediately below said lid center section and inner flange in the area adjacent said overlap to block the opening between the lines of tangency where the lid inner flange contacts the inner and outer body wall end portions.

4,429,826

SLIP CASE FOR FILING BOX

David E. Shedd, Barrington, R.I., assignor to Taylor Box Co., Warren, R.I.

Filed Feb. 28, 1983, Ser. No. 470,005
Int. Cl.³ B65D *13/06, 5/38*
U.S. Cl. 229—23 BT **2 Claims**



1. A slip case comprising an inner part and an outer part, the inner part having a bottom, front and side walls with a retainer lip joining the peripheries of the bottom and a portion of the side walls contiguous to the bottom wall opposite said frot wall to define an opening, said lip having a height substantially less than the height of said front wall; the outer part comprising a rectangular form having back, two sides, top and bottom walls, the sides, top and bottom walls defining an open front to receive the inner part; a one-piece outer cover for the outer part of a dimension to totally overlie the back and said two side walls and having a pair of flaps extending from opposite sides of that portion of said outer cover which overlies one of said sides, said flaps having a width greater than the top and bottom wall width, said flaps folding over the top and bottom walls and partially down the other of said side walls, the cover over the other of said walls overlying the edges of the flaps.

4,429,827

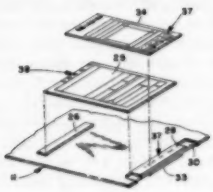
DOCUMENT MAILER AND POSTAL SYSTEM

Myles N. Murray, 15 Skyline Dr., Chagrin Falls, Ohio

Filed Aug. 17, 1981, Ser. No. 293,296
Int. Cl.³ B65D *27/00*
U.S. Cl. 229—68 R **10 Claims**

1. A mailer in combination with a document, comprising an enclosure in which the document is to be mailed, said enclosure having a window for exposing a part of the document contained in said enclosure, and return receipt means secured to said enclosure for permitting acknowledgement of receipt of the mailer and document by the recipient, said return receipt means including a first portion overlapping said window and affixed to the document at said window, and a second portion constituting a return receipt detachably secured to said first

portion and said enclosure whereby said return receipt can be endorsed by the recipient, detached and returned to the sender



as acknowledgement of receipt of the document as well as the mailer.

4,429,828

BEVERAGE PACKAGE

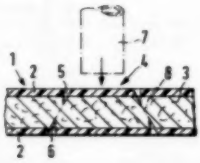
Jürgen Färber, Kaarst, Fed. Rep. of Germany, assignor to PLK Papier- und Kunstoff Werke Linnich GmbH, Dusseldorf, Fed. Rep. of Germany

Filed Sep. 28, 1981, Ser. No. 306,107

Claims priority, application Fed. Rep. of Germany, Oct. 4, 1980, 3037657

Int. Cl.³ B65D *17/28, 17/42*

U.S. Cl. 229—75 **3 Claims**



1. In a cardboard container plastic coated on at least one of its inside and outside and provided with a weakened area through which a straw is to be inserted, the improvement which comprises a pair of incisions penetrating deeper than half the thickness of the container and surrounding such area on the inside and outside of the container respectively, the area enclosed by the incision on the outside being smaller than the area enclosed by the incision on the inside.

4,429,829

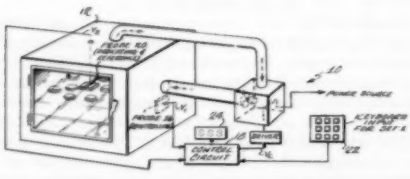
INTERACTIVE DUAL PROBE TEMPERATURE CONTROL SYSTEM

Edmund L. Dutton, Marietta, Ohio, assignor to Mallinckrodt, Incorporated, St. Louis, Mo.

Filed Nov. 20, 1981, Ser. No. 323,476

Int. Cl.³ G05D *15/00;* **A01G** *23/10*

U.S. Cl. 236—78 B **11 Claims**



1. An interactive dual temperature sensing system for controlling temperature within a defined space, said system comprising:

a controllable thermal source connected to provide thermal input to said defined space in at least one source location;

a first temperature sensor position at a first location within said defined space relatively near said thermal input;

a second temperature sensor positioned at a second location within said defined space relatively further from said thermal input than said first location; and

an electronic control circuit connected to said source and to said first and second sensors including means for automatically controlling said source based on the temperature (TEMP1) sensed at said first location with respect to a controlling setpoint temperature (SET2) that is automatically adjusted to minimize the difference between the temperature (TEMP2) sensed at said second location and a particular desired temperature (SET1);

said first location being at a location for achieving rapidly responsive control of said source;

said second location being approximately at the optimum location for accurately indicating the true temperature of a desired portion of said defined space;

said electronic control circuit including

a digital data processor means programmed to store digital data representing the temperatures sensed by said first and second temperature sensors (TEMP1 and TEMP2 respectively), the temperature control set point (SET2) and the desired temperature (SET1),

said digital data processor means also being programmed to iteratively adjust said setpoint data value (SET2) by incrementing/decrementing then existing setpoint (SET2) with the calculated difference in value between said desired and actual sensed temperature at said second location (SET1 and TEMP2 respectively);

said digital data processor means being programmed to perform said incrementing/decrementing only after a predetermined elapsed time period greater than the thermal response time of the defined space.

4,429,830

SPACE AND UTILITY WATER HEATING SYSTEM

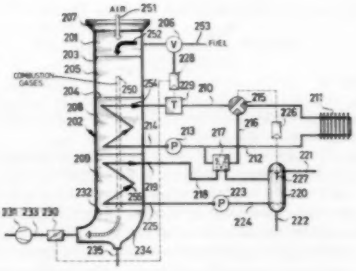
Siegfried Förster, Alsdorf, and Peter Quell, Aachen, both of Fed. Rep. of Germany, assignors to Kernforschungsanlage Jülich GmbH, Jülich, Fed. Rep. of Germany

Filed Apr. 14, 1981, Ser. No. 254,092

Claims priority, application Fed. Rep. of Germany, Apr. 14, 1980, 3014180

Int. Cl.³ F24D *3/08*

U.S. Cl. 237—19 **7 Claims**



1. A heating system comprising:

a heating unit including a fuel-fired burner, a combustion chamber in which a hot combustion gas is generated by said burner, and a recuperator through which said gas is passed in at least a first and a second zone in indirect heat

exchange with a recirculatable space heating fluid and hot utility water, respectively;

means including a feedline connected to a high-temperature end of said first zone, at least one space heater connected to said feedline, at least one return line connected to said space heater, and a circulator forming a circulation path for said space-heating fluid through said first zone;

means including a hot water storage tank and a pump for circulating hot water between said tank and said second zone for circulating hot water;

a heat exchanger having two sections in heat exchanging relation with one another;

means forming a bypass through one of said sections between said feedline and said return line, and at least one valve for controlling the flow through said bypass, said means for circulating hot water between said tank and said second zone including the other section of said heat exchanger;

first control means responsive to the temperature of water in said tank for controlling said valve; and

second control means responsive to the temperature in said feedline for controlling the rate of fuel flow to said burner and the rate of flow of said gas through said recuperator.

4,429,831

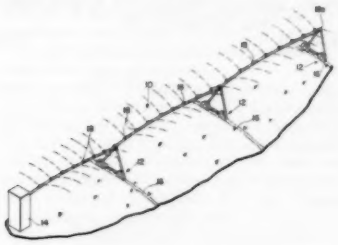
GROUND RELEASE IRRIGATION SYSTEM

Gerald H. Maddox, 5820 Sunrise Rd., Lincoln, Nebr. 68510

Continuation-in-part of Ser. No. 187,985, Sep. 17, 1980, abandoned. This application Mar. 27, 1981, Ser. No. 248,541

Int. Cl.³ B05B *3/00*

U.S. Cl. 239—177 **8 Claims**



1. For use in combination with a pivot-type irrigation system wherein a water distribution pipe supplied from a central source is rotated through a path of travel to provide irrigation of the area covered thereby, a plurality of downwardly depending hose fittings disposed along the length of the pipe, a plurality of flexible hoses attached to respective ones of said plurality of hose fittings, said hoses extending from the main pipe to the ground so as to release water therefrom at the distal end thereof at ground level, and hose movement restraining means for preventing lateral movement of said hoses relative to said path of travel, said hose restraining means including mounting means provided on opposite sides of each said hose fitting above the associated hose and a plurality of downwardly depending restraining braces, each supported by a said mounting means so as to be swingable in the direction of the path of travel of the distribution pipe, for restraining lateral movement of said hoses.

4,429,832

PROJECTABLE LAWN SPRINKLER

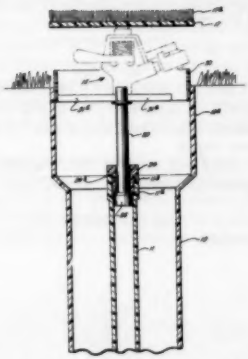
Kerney T. Sheets, P.O. Box 771, Duplessis, La. 70728

Filed Oct. 16, 1981, Ser. No. 312,351

Int. Cl.³ B05B *15/10*

U.S. Cl. 239—204 **3 Claims**

1. In a projectable lawn sprinkler having a housing, a stationary pipe located in the interior of said housing and connected to the base of said housing, a projectable conduit slidably connected to the interior of said stationary pipe, and a means for spraying water connected to said projectable conduit means, the improvement comprising guard means connected to said projectable conduit and slidably received inside said housing for preventing foreign matter from entering the interior of said housing, the top of said guard means being projectable to a position above the top of said housing, said projectable guard means being a cylinder, the top of said cylinder extending above the top of said housing when said projectable conduit means is projected to its uppermost height.



4,429,833

PROCESS AND DEVICE FOR DELIVERING A LIQUID ONTO A ROTATING AND HOLLOW BODY

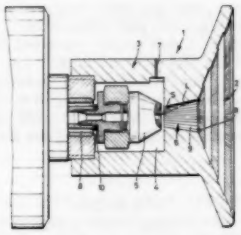
Roland Meisner, Schorndorf, and Hagen Buchholz, Münster, both of Fed. Rep. of Germany, assignors to BASF Farben & Fasern AG, Hamburg, Fed. Rep. of Germany

Filed Nov. 30, 1981, Ser. No. 326,037

Claims priority, application Fed. Rep. of Germany, Dec. 18, 1980, 3047670

Int. Cl.³ B05B *3/10*

U.S. Cl. 239—224 **5 Claims**



1. An apparatus to feed from a fixed feed part a fluid, for instance a liquid coating means, in the form of a liquid sheet shaped in the manner of a surface of a cone to the inner contour of a rotatable spray bell (1) having a bell-shaped hollow body (2) symmetrical about the axis of rotation thereof and having a cylindrical end part (3) where the fluid is accelerated and guided to a rim of the spray bell (1),

a fixed hollow cone nozzle (5) at the feed end of the feed part to generate the liquid sheet in the form of a conical surface,

and a transfer surface (6) spaced opposite the mouth of the hollow cone nozzle (5), having the shape of a hollow

frustrum-of-cone, and located in the rotatable spray bell (1),

said hollow frustrum-of-cone transfer surface (6) tapering toward the hollow conical nozzle (5), said hollow conical nozzle (5) being mounted in the cylindrical end part (3), and said hollow frustrum-of-cone transfer surface (6) being hollowed out between the bell-shaped hollow body (2) and the cylindrical end part (3).

4,429,834

MOUTH CLOSURE ASSEMBLY FOR MOUTH OF FOAM LIQUID DISPENSING CONTAINER

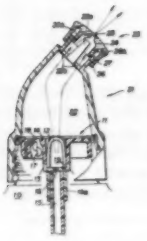
Kazuo Ito, Kamakura, Japan, assignor to Toyo Seikan Kaisha, Ltd., Tokyo, Japan

Filed Feb. 11, 1982, Ser. No. 348,146

Claims priority, application Japan, Apr. 13, 1981, 56-52884[U]

Int. Cl.³ B65D *1/32*

U.S. Cl. 239—327 8 Claims



1. A mouth closure assembly for the mouth of a squeezable foam liquid dispensing container, comprising an inner foaming portion fitted in said mouth of the container and including foamable liquid and air mixing means, air guide means for guiding air into said mixing means, a mixing means holder and replacing air inflow control means; and a detachable outer foam liquid dispensing portion surrounding said container mouth and said inner foaming portion and including a cavity defined therein in communication with said mixing means and a closure cap for closing said cavity, said mixing means including a porous member defining a mixing chamber therein and supported by a holder fitted in said mouth of the container, said porous member having through holes, said air guide means including a pipe positioned immediately below and depending from said porous member and communicating with the interior of said containter, a pipe holder interposed between said porous member and said pipe and formed with a through hole communicating between said mixing chamber and pipe, and said air inflow control means including an air vent hole formed in said porous member holder and a check valve disposed in said porous member holder for closing and uncovering said air vent hole.

4,429,835

SPRAY-DIFFUSER

Inge Brugger, Prinz Karl Str. 50a, D-8130 Starnberg, and Emeram Steil, Starnberg, both of Fed. Rep. of Germany, assignors to Inge Brugger, Starnberg, Fed. Rep. of Germany

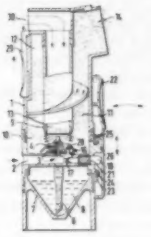
Filed Nov. 13, 1981, Ser. No. 321,013

Claims priority, application Fed. Rep. of Germany, Nov. 17, 1980, 3043377

Int. Cl.³ B05B *7/00*; A61M *11/02, 15/00*

U.S. Cl. 239—338 15 Claims

1. A spray-diffuser for the atomisation of liquids or solid substances, such as medicaments, with the help of a flow of compressed air especially for inhalation purposes, having located in an atomisation chamber a spray-diffuser nozzle which is connected to a compressed air channel and having a suction arrangement for sucking up the medicament, whereby the compressed air channel adjacent the nozzle has, for escape of the compressed air, a release opening which is settable to a non-operating position, characterized in that the release opening (15) leads into the atomisation chamber (10) in its operating position during exhalation and that the channel also has an atomizing opening leading to said nozzle for inhalation.



4,429,836

APPARATUS FOR DISINTEGRATING AND MIXING FOODSTUFFS

Bengt Göransson, Östanbergsv.34, Örebro, Sweden

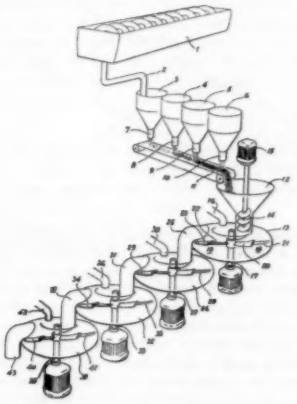
PCT No. PCT/SE80/00238, § 371 Date Jun. 4, 1981, § 102(e) Date Jun. 4, 1981, PCT Pub. No. WO81/00956, PCT Pub. Date Apr. 16, 1981

PCT Filed Oct. 2, 1980, Ser. No. 270,522

Claims priority, application Sweden, Oct. 4, 1979, 7908219

Int. Cl.³ A47J *43/07*

U.S. Cl. 241—282.1 1 Claim



1. Apparatus for providing continuous cutting and mixing of foodstuff such as sausage, comprising:

a generally cylindrical vessel having an axially disposed rotatable shaft and an annular processing space surrounding said shaft, said vessel having two annular halves rotatable with respect to each other about the axis of said shaft;

a foodstuff inlet adjacent a radially inner part of said annular processing space and a foodstuff outlet adjacent a radially outer part of said annular processing space; and

a pair of mixing and cutting blades extending in opposite directions radially out from said shaft for rotation therewith, each blade having a radially inner portion and a radially outer portion, the inner portion of each blade being pitched to urge the foodstuff in one axial direction while cutting it, the outer portion of each blade being

pitched to urge the foodstuff in the opposite axial direction.

4,429,837

BLADE ASSEMBLY FOR MEAT CHOPPER

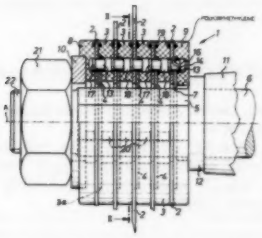
Fritz Knecht, D-7981 Heissen-Vogt, Fed. Rep. of Germany

Filed Nov. 25, 1981, Ser. No. 324,977

Claims priority, application Fed. Rep. of Germany, Nov. 27, 1980, 3044632

Int. Cl.³ B02C *18/20*

U.S. Cl. 241—292.1 **10 Claims**



1. A blade assembly for a meat cutter, said blade assembly comprising:

a support shaft extending along an axis and having an end member and a noncircular-section portion extending axially from said end member;

a plurality of like metallic support disks having respective central holes traversed by and complementary to said noncircular-section portion and respective outer peripheries;

respective metallic blades bearing in surface contact axially on said support disks and each having a radially outwardly projecting cutting portion extending radially outward past the outer periphery of the respective support disk, said blades with the respective suport disks being axially spaced along said noncircular-section portion;

means including respective fasteners engaged axially through said support disks and the respective blades for securing each blade to the respective support disk for joint rotation therewith;

a plurality of spacer rings of a rigid synthetic resin axially alternating with the blades and the respective disks, each of said rings engaging axially in one direction on one respective blade and the respective support disk and axially in the opposite direction on the adjacent blade and the respective support disk; and

another end member screwed onto said support shaft and pressing said support disks, blades, and spacer rings axially together against the other end member.

4,429,838

CLAMPING CHUCK IN WINDING MACHINES

Erich Lenk, and Hansjochen Busch, both of Remscheid, Fed. Rep. of Germany, assignors to Barmag Barmer Maschinenfabrik AG, Remscheid-Lennep, Fed. Rep. of Germany

Filed Oct. 15, 1981, Ser. No. 311,749

Claims priority, application Fed. Rep. of Germany, Oct. 16, 1980, 3039064; Nov. 27, 1980, 3044707

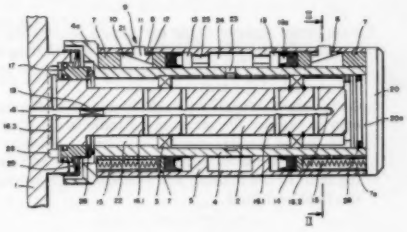
Int. Cl.³ B65H *54/54*

U.S. Cl. 242—46.4 **8 Claims**

1. In a clamping chuck on a thread-winding machine for the reception of a removable bobbin carrier wherein said chuck includes a chucking spindle turnably borne on and extending from the machine frame, a cylindrical mantle sleeve mounted concentrically about said spindle and having an inner diameter greater than an outer diameter of said spindle over a substantial portion of the total length of the chuck so as to define at least one annular cylindrical interspace between said sleeve and said spindle at a selected axial position along the chuck, and clamping means situated within said interspace and being radially movable through openings in said mantle sleeve, the improvement which comprises:

a plurality of clamping elements arranged in said interspace between said spindle and said mantle sleeve for free radial movement in an axial plane of the chuck, each clamping element having a radially outermost clamping end which is radially movable of its sleeve opening and guided by said opening between an extended position for gripping the bobbin carrier and a retracted position for releasing the bobbin carrier and having a radially innermost sliding end surface which is inclined with respect to the chuck axis;

a plurality of wedge-shaped thrust members, each of said thrust members being paired with a clamping element and being defined by a radially outermost end surface inclined with respect to the chuck axis to provide a sliding support in contact with the correspondingly inclined inner end



surface of its paired clamping element, and each wedge-shape thrust member being slidably carried on the spindle for movement back and forth in an axial direction as its supported clamping element is moved radially between said extended position and said retracted position;

spring and pneumatic actuated cage means having axially spaced and opposing annular end walls which act as pistons to exert opposite axial forces on each of said thrust members while the clamping element is guided in its sleeve opening in radial direction in order to cause a relative movement between each clamping element and the axially inclined surface of its paired wedge-shaped thrust member;

spring means to actuate said cage means while the chuck is in operation in order to maintain a radial gripping force exerted by said outermost clamping end of said clamping element on said bobbin carrier; and

pneumatic means cooperating with said cage means to exert a pneumatic force opposing said spring actuation of said cage means in order to release each clamping element.

4,429,839

WATER SKI TOW ROPE REEL APPARATUS

Donald W. Jessamine, 401 Aurora St., Phillipsburg, N.J. 08865

Filed Dec. 10, 1981, Ser. No. 329,233

Int. Cl.³ B65H *75/28, 75/40*

U.S. Cl. 246—96 **5 Claims**

1. Water ski tow rope reel apparatus comprising, in combination:

housing means, including

a floor,

a wall secured to the floor and extending substantially perpendicular thereto,

a handle for holding the housing, and

a slot extending through the wall through which a tow rope passes;

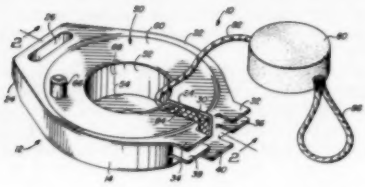
reel means secured to the housing means and rotatable relative thereto, including

a bottom wall disposed adjacent to the bottom of the housing means,

cylindrical wall means extending substantially perpendicular to the bottom wall means and about which the tow rope is wound,

an outwardly extending flange remote from the bottom wall and extending outwardly radially from the cylindrical wall, and

a slot extending through the flange and the wall through which a portion of the tow rope is disposed;



handle means secured to the reel means for rotating the reel means relative to the housing means for winding the rope through the slot in the housing means and about the cylindrical wall of the reel means; and

holding means integral with said housing and disposed adjacent to the slot for securing a handle of a water ski tow rope to the housing means, including a plurality of flat, opposed tabs spaced apart from each other and parallel to the floor of the housing and extending downwardly from the housing means.

4,429,840

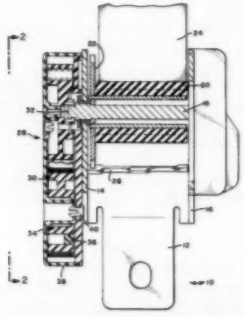
WINDING SPRING ESPECIALLY FOR SEAT BELT RETRACTOR

Jai H. Chawla, Knoxville, Tenn., and Arduino Colasanti, East Detroit, Mich., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Mar. 26, 1982, Ser. No. 362,185

Int. Cl.³ B65H *75/48*

U.S. Cl. 242—107 **10 Claims**



6. In a seat belt retractor comprising a frame, a main shaft rotatable in said frame, a spool mounted on said shaft for rotation therewith, seat belt webbing having one end attached to said spool and adapted to be wound thereon, and a rewind spring motor mounted on said frame for winding said webbing on said spool and permitting said webbing to be extracted from said spool, the improvement comprising:

said rewind spring motor comprising:

a drive spool rotatable with said main shaft;

an idler spool mounted for rotation about a second shaft spaced from said main shaft; and

a rewind spring having a stretched S-shape and disposed between said drive spool and said idler spool; said rewind spring having a first end in communication with said drive spool; a second end in communication with said idler spool; a normal use region extending from said drive spool toward said idler spool and comprising a first portion in communication with said first end and having a first natural radius of curvature, and a second portion in communication with and extending from said first portion toward said idler spool, said second portion having a second natural radius of curvature, said second natural radius of curvature being larger than said first natural radius of curvature, the transition between said first and second portions being defined by an abrupt increase in the natural radius of curvature; and a surplus use region extending from said second portion to said second end of said spring.

4,429,841

EMERGENCY LOCKING DEVICE FOR SAFETY BELT RETRACTOR

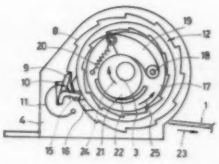
Kenzou Kassai, Osaka, Japan, assignor to Kassai Kabushikikaisha, Osaka, Japan

Filed Jul. 15, 1982, Ser. No. 398,668

Claims priority, application Japan, Aug. 4, 1981, 56-122694

Int. Cl.³ A62B *35/02;* **B65H** *75/48*

U.S. Cl. 242—107.4 B **5 Claims**



1. An emergency locking device equipped with a safety belt retractor wherein a reel **(2)** for winding a safety belt **(1)** thereon is rotatably mounted on a fixed reel support **(4)** with a shaft **(3)** fixed to the reel **(2)** being journaled on the support **(4)**, and the reel **(2)** is biased to rotate in a belt rewinding direction by a return spring **(5)**, comprising:

a ratchet wheel **(8)** fixed to the reel **(2)**;

a locking pawl **(9)** mounted on the reel support **(4)** so as to be movable between engaging and disengaging positions with respect to the ratchet wheel **(8)**;

a releasing spring **(11)** urging the locking pawl **(9)** toward a disengaging position from the ratchet wheel **(8)**;

a drum-shaped clutching wheel **(12)** rotatably mounted on the shaft **(3)**, said clutching wheel **(12)** being provided with inner ratchet teeth **(14)** on its inner peripheral surface and engaging projections **(16)** on its outer peripheral surface, said engaging projections **(16)** being engaged with said locking pawl **(9)**;

a locking initiating inertia member **(21)** rotatably mounted on said shaft **(3)**, said inertia member **(21)** having its outer peripheral surface radially offset from the central axis of the shaft **(3)**;

a mounting plate **(17)** fixedly positioned on said shaft **(3)**;

a locking transmission pawl **(19)** pivotally mounted about an axis **(18)** on said mounting plate **(17)**, said locking transmission pawl **(19)** keeping in contact with the outer peripheral surface of said locking initiating inertia member **(21)** so as to be movable between engaging and disengaging positions with respect to one of said inner ratchet teeth according to the rotation of said locking initiating inertia member **(21)** with respect to said shaft **(3)**;

a biasing spring **(20)** urging said locking transmission pawl **(19)** to be disengaged from said inner ratchet teeth **(14)**; and

a control member **(22)** mounted on said mounting plate **(17)** to limit the rotation of said locking initiating inertia member **(21)** within a predetermined range.

4,429,842

CENTRAL CONNECTIBLE YARN BRAKE MECHANISM

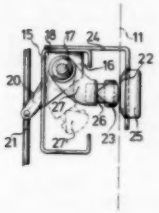
Wilhelm Küpper, Wegberg, Fed. Rep. of Germany, assignor to W. Schlafhorst & Co., Monchen-Gladbach, Fed. Rep. of Germany

Filed Nov. 19, 1982, Ser. No. 442,900

Claims priority, application Fed. Rep. of Germany, Nov. 20, 1981, 3145990

Int. Cl.³ B65H 59/22

U.S. Cl. 242—149 1 Claim



1. Central connectible yarn brake mechanism for doffed threads from a creel, comprising a profiled metal bar having at least one groove formed therein, stationary first brake elements being mutually spaced apart along said metal bar outside said groove and each being associated with one of the threads, first means for individually connecting said first brake elements to said metal bar, movable second brake elements each being associated with one of the threads and being movable between a braking position in which said second brake elements are biased against a thread and against a respective one of said first brake elements and a detached position in which said second brake elements are lifted from a respective one of said first brake elements, bearings disposed on said metal bar in said groove, a central rotatable bar movable in said bearings in said groove, levers each being fastened to said rotatable bar, and second means for individually connecting each of said levers to a respective one of said second brake elements for holding said second brake elements and moving said second brake elements between said braking and detached positions, at least one of said connecting means being an elastically deformable connection element.

4,429,843

COUNTER-ROTATING VORTICES GENERATOR FOR AN AIRCRAFT WING

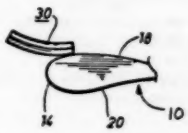
Roger A. Thompson, 7606 Joplin, Apt. 2, Houston, Tex. 77087

Continuation-in-part of Ser. No. 960,221, Nov. 13, 1978, Pat. No. 4,323,209. This application Mar. 24, 1982, Ser. No. 361,421

The portion of the term of this patent subsequent to Apr. 6, 1999, has been disclaimed.

Int. Cl.³ B64C 23/06

U.S. Cl. 244—199 21 Claims



1. Apparatus for increasing the lift generated by a wing, having upper and lower surfaces, while propelled through a fluid medium comprising:

a finger mounted adjacent to the leading edge of said wing and extending forwardly therefrom such that the finger is essentially tangential to the upper surface of said wing, said finger having lateral edges thereon;

said finger being mounted on the wing such that as the wing is propelled through the fluid medium, impingement of the fluid medium on said finger produces by flow around said lateral edges, a first and second vortex trailing rearwardly from said finger over the wing in the direction of fluid flow, each of said vortices being in contact with and counter-rotating with respect to the other; and

said finger being sized such that each vortex produced thereby is of sufficient size and strength to modify the flow pattern above the boundary layer on the wing upper surface so as to effect an increase in the lift.

4,429,844

VARIABLE CAMBER AIRCRAFT WING TIP

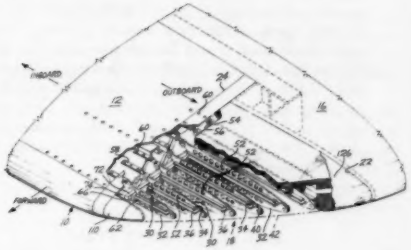
Stephen T. Brown, Bellevue, and Frank D. Statkus, Woodinville, both of Wash., assignors to The Boeing Company, Seattle, Wash.

PCT No. PCT/US82/01354, § 371 Date Sep. 29, 1982, § 102(e) Date Sep. 29, 1982

PCT Filed Sep. 29, 1982, Ser. No. 451,216

Int. Cl.³ B64C 3/48

U.S. Cl. 244—219 38 Claims



9. In an aircraft wing, a variable camber wing tip forming an outboard and forward portion of said wing, said wing tip comprising:

an inboard generally fore and aft extending end of the wing tip being secured along a complementary outer end of a variable camber leading edge portion of the wing;

a trailing edge of the wing tip extending along a fixed outboard forwardly facing edge of the wing;

said wing tip having a normal camber on its upper surface in an upper position and being adapted to have an increased camber curvature in a deflected down position;

said wing tip in the down position having a compound curvature between the upper cambered surface and its lower surface, the wing tip being curved downwardly forwardly and outboardly in the down position; and

means within the wing tip adapted to be actuated to vary the camber from the upper portion to the down position and return.

4,429,845

RAIL TRACK HEATERS

John C. Stover, Verona, and Paul J. Borkoski, North Huntingdon, both of Pa., assignors to Emerson Electric Co., St. Louis, Mo.

Filed Apr. 26, 1982, Ser. No. 371,669

Int. Cl.³ E01B 7/24

U.S. Cl. 246—428 5 Claims

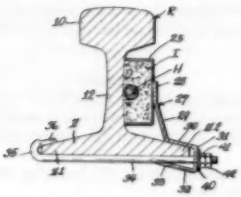
1. Heating means for a railway rail, said rail having a head, a base flange and a web integrally connecting said base flange and head, the improvement comprising:

an elongated, tubular, metal-sheathed electric heating ele-

ment held in position parallel to said rail and against a side surface of said web and operable to heat the same,

a channel-shaped, sheet metal cover transversely encompassing a length of said element,

a bracket holding said channel-shaped cover in position, including an upper vertical portion in engagement with the outer surface of a side of said cover, said bracket having a U-shaped portion fitting around a transverse terminal portion of said base flange, the web of said U-shaped portion having a hole therethrough,



an elongated bolt underlying said base flange and having a threaded end extending through the hole in said U-shaped portion and having an opposite hook-shaped end adapted to hook around a transverse terminal portion of said base which is opposed to said first-named transverse portion,

and a nut threaded on said bolt threaded end and operable to draw the hook-shaped bolt end and said bracket together to clamp said base flange therebetween and urge said upper vertical portion of said bracket and said channel-shaped cover against which it bears in a direction toward said web side.

4,429,846

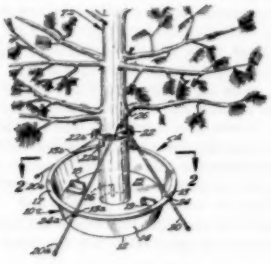
ADJUSTABLE TREE STAND

Harlan L. Halvorson, 701 - 6th St. SW., Wells, Minn. 56097

Filed Jun. 22, 1981, Ser. No. 275,900

Int. Cl.³ F16M *13/00*

U.S. Cl. 248—524 **8 Claims**



1. An adjustable tree stand comprising:

(a) a circular support having a central, vertical axis,

(b) means for connecting a tree trunk to said support,

(c) a circular adjusting plate having a central axis substantially perpendicular to the plate,

(d) means mounting said circular plate on said support for rotation thereon with the axis of said circular support coinciding with the axis of said plate,

(e) means for mounting the lower end of a tree on the plate offset from the axis of the plate,

(f) means associated with said plate for rotating said plate on said support to cant a tree mounted thereon relative to the vertical axis of said support.

4,429,847

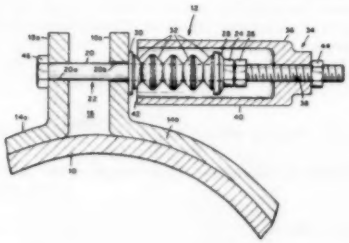
SPRING BYPASS ASSEMBLY

Henry Jablonski, San Jose, and Jeffrey D. Roughgarden, Palo Alto, both of Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jun. 2, 1982, Ser. No. 384,306

Int. Cl.³ F16L *3/08*

U.S. Cl. 248—74 R **4 Claims**



1. A collar assembly for restraining an object, comprising:

a clamp rim conforming to the periphery of said object and extending substantially completely thereabout with at least one contraction and expansion gap interrupting its continuity about said object, ends of said rim at said gap being formed with flanges which project radially outward from said object in spaced but juxtaposed relation to each other, an aperture extending through each of said flanges in a circumferential direction relative to said object;

means for resiliently biasing said flanges toward each other, comprising (1) a shaft extending through the aperture in each of said flanges and projecting away from one flange on the side thereof remote from the other flange, (2) annular spring means extending around the projecting portion of said shaft, and (3) means mounted on the projecting portion of said shaft for holding said spring means against said one flange; and

means for limiting movement of said flanges away from each other, comprising (1) an elongate stop element having a first portion formed with an aperture through which said shaft extends and a second portion which projects from said first portion toward said one flange and is normally spaced therefrom to allow a predetermined expansion of said object and separation of said flanges before said one flange engages the second portion, and (2) means for adjustably holding said stop element at different locations along the length of said shaft.

4,429,848

SURGICAL HANGER

Chee C. Gunsolus, 3402 SE. Inlet Harbor Trail, Stuart, Fla. 33494

Filed Jan. 15, 1982, Ser. No. 339,371

Int. Cl.³ A62C *23/04*

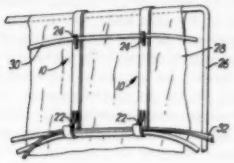
U.S. Cl. 248—75 **7 Claims**

1. A hanger comprising:

an elongated strip of rigid material having an intermediate portion and terminal end portions bent out of the plane of said intermediate portion in the form of terminal hooks; and

a releasable latch cooperatively positioned adjacent at least one of said hooks for releasably securing a hose or the like within said one hook, said latch comprising an elongated

shiftable element normally in at least partial blocking relationship to the open end of said one hook, said element



being integral with said strip and projecting obliquely therefrom.

4,429,849

FRAME FOR SETTING UP THE LINES PREPARATORY TO ERECTION OF BUILDINGS OR THE LIKE

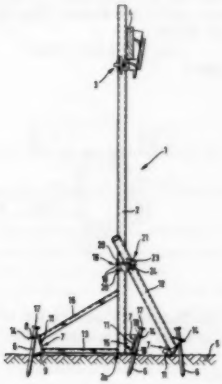
Josef Maier, Schwimmbadstr. 3, D-7611 Steinach, Fed. Rep. of Germany

Filed Nov. 19, 1980, Ser. No. 208,408

Claims priority, application Fed. Rep. of Germany, Nov. 30, 1979, 2948230

Int. Cl.³ A45F *3/44*

U.S. Cl. 248—156 **31 Claims**



1. A frame for setting up lines preparatory to excavation at building sites or the like comprising:

(a) a post;

(b) at least one leg adjacent to the ground for connecting said post to the same, said leg being substantially U-shaped and including a pair of overlapping substantially parallel flanges which are connected by a web and are disposed in respective planes, said flanges being substantially perpendicular to said web and each of said flanges being provided with an opening having an axis which is generally normal to the plane of the respective flange, said leg being arranged such that said flanges are parallel to or make an acute angle with the ground, said web being fixedly secured adjacent one end of said post and defining an acute angle with respect to the longitudinal axis of said post; and

(c) securing means for securing said leg to the ground, said securing means including at least one securing member extending with clearance through at least one of said openings and into the ground.

4,429,850

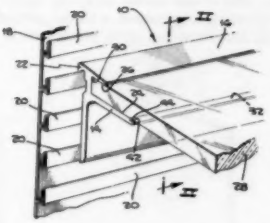
DISPLAY PANEL SHELF BRACKET

Karl Weber, Laguna; Michael Schlinger, Yorba Linda, and Richard Beedle, Costa Mesa, all of Calif., assignors to Uniweb, Inc., Anaheim, Calif.

Filed Mar. 25, 1982, Ser. No. 361,785

Int. Cl.³ A47G *29/02*

U.S. Cl. 248—250 **3 Claims**



1. A unitary bracket for holding a shelf to a panel as its sole support, said bracket comprising;

(a) a back portion including means for holding said back portion horizontally disposed against the panel;

(b) a lower support portion extending horizontally outward from said back portion and having a top surface upon which the shelf can rest, said top surface having a front edge disposed equally distant from the panel when the bracket is attached to the panel;

(c) an upper support portion extending outward from said back portion above and parallel to said top surface of said lower portion and having a bearing bottom surface adjacent said back portion adapted to bear along the top inner edge of a shelf disposed in the bracket between said lower and upper support portions, said front edge being a distance away from said bearing surface short enough being that the weight of the shelf extending beyond said front edge will tend to rotate the shelf about said front edge and against said bearing surface to thereby cause a gripping action on the shelf while, at the same time, said distance is long enough that said lower support portion can support the shelf in a horizontal position; and

(d) wherein said back portion, lower support portion and upper support portion are formed integrally of each other and together form a longitudinally extending shelf edge receiving channel closely fitting and coextending with adjacent marginal areas of the edge of said shelf received therein;

(e) wherein said front edge of said top surface of said lower support portion is provided with a groove coextensive with the longitudinal extent of said front edge and; a strip of material having a high coefficient of friction coextensive with and fixedly disposed in said groove is provided whereby the retention of said shelf in said channel is facilitated.

4,429,851

MOBILE HOME STABILIZER

Thomas M. DeJager, 39369 Oak View Rd., Yucaipa, Calif. 92399

Filed Apr. 15, 1981, Ser. No. 254,473

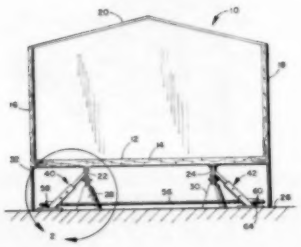
Int. Cl.³ B60S *9/02*

U.S. Cl. 248—354 S **6 Claims**

1. A mobile home stabilizer system for stabilizing against lateral earth movement comprising:

first and second stabilizer legs, each said stabilizer leg having an upper end and a lower end, each said stabilizer leg being formed of a tube and a rod with said rod telescopically mounted for sliding motion within said tube for the length adjusment of said stabilizer leg, and fixing means is

provided for fixing the length of said stabilizer leg at a predetermined length, a first pad on the upper end of said first stabilizer leg for rigid attachment to one of the longitudinal strength members of a mobile home, a second pad on the upper end of said second stabilizer leg for rigid attachment to another of the longitudinal strength members of the mobile home, a first substantially flat foot rigidly secured at the lower end of said first stabilizer leg for substantially non-penetrating engagement with the ground, a second substantially flat foot rigidly secured at the lower end of said second stabilizer leg for substantially non-penetrating engagement with the ground, said pad on each said stabilizer leg being positioned at substantially



right angles with respect to said foot on said same stabilizer leg, said stabilizer legs being oriented at an acute angle between said feet and said pads and at an acute angle with respect to the ground and being directed away from each other so that said first and second feet are farther apart from each other stabilizer legs being oriented so that said first and second pads and second first and second feet substantially lie in a plane which lies substantially at right angles to the longitudinal strength members; and

connection means on said first and second stabilizer legs for attaching said first stabilizer leg to said second stabilizer leg so that upon lateral movement said stabilizer legs move with the mobile home.

4,429,852

ADAPTER

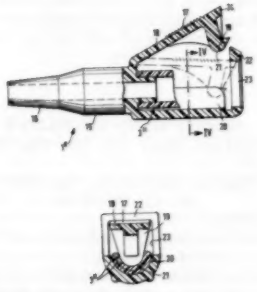
Bernd Tersteegen, and Gunter Van Endert, both of Karlstrasse 17-19, 4000 Dusseldorf, Fed. Rep. of Germany

Continuation of Ser. No. 313,157, Oct. 20, 1981. This application Apr. 11, 1983, Ser. No. 482,017

Claims priority, application Fed. Rep. of Germany, Oct. 21, 1980, 3039591

Int. Cl.³ F16L *55/14*; A61B *17/00*

U.S. Cl. 251—9 **2 Claims**



1. An adapter for connecting first and second tubes comprising: an adapter body; first connecting means on said body for attachment to said first tube; second attachment means on said body for attachment to said second tube; manually movable compression means formed integrally with said body comprising a clamping member movable with respect to said body and having an arcuately shaped tube engaging portion, said compression means being movable under manual pressure from an open position to a closed position wherein one of said tubes is at least partially constricted; said body including an integrally formed support having an arcuately shaped tube engaging surface, said support being positioned opposite of said clamping member with respect to said one tube for cooperation with said clamping member when said compression means is positioned in said closed position to compress said one tube between said clamping member and said support, said arcuately shaped tube engaging surface being generally defined by a radius greater than a further radius generally defining said arcuately shaped tube engaging portion; said adapter further including latching means formed integrally with said body and formed by a portion of a wall defined by an opening through which said one tube extends, said wall being integrally formed with said support; said latching means being adapted to engage and coact with catch means formed integrally with said compression means to releasably retain said compression means in said closed position.

4,429,853

DISCONNECTING VALVE ROCKER MECHANISM

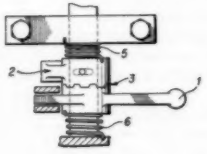
Pierre Chaffiotte, Saint Cloud, and Christian Guicherd, Le Pecq, both of France, assignors to Regie Nationale des Usines Renault, Boulogne-Billancourt, France

Filed Apr. 28, 1981, Ser. No. 258,315

Claims priority, application France, May 8, 1980, 80 10284; Oct. 17, 1980, 80 22235

Int. Cl.³ F02D *13/06*

U.S. Cl. 123—198 F **11 Claims**



1. A rocker mechanism for putting out of use at least one cylinder of an internal combustion engine, said mechanism comprising:

a rocker shaft;

at least one first rocker element pivotally mounted on said shaft, said first rocker element including a first meshing portion formed on a first axial face thereof and being adapted to control an inlet valve of a cylinder by the pivoting of said first rocker element on said shaft;

at least one second rocker element pivotally mounted on said shaft, said second rocker element including a second meshing portion formed on a second axial face thereof facing said first axial face and being adapted to pivot in response to an engine cam shaft, wherein each said first rocker element is mounted on said shaft in an axially slidable manner, and wherein each said second rocker element is mounted on said shaft in an axially fixed manner and includes means for permitting relative angular movement between said shaft and each said second rocker element; and

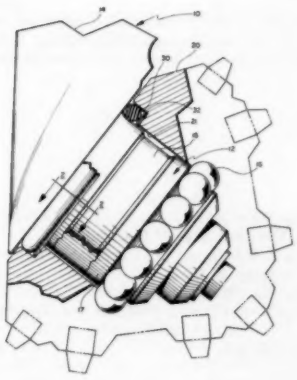
control means mounted on a stationary portion of said engine for selectively axially moving said first rocker element such that said first and second meshing portions are meshing with one another, whereby said first and second rocker elements pivot as a single body.

4,429,854

DUAL SQUEEZE SEAL GLAND

Nareshchandra J. Kar, Westminster, and Rao R. Nimmagadda, Fountain Valley, both of Calif., assignors to Smith International, Inc., Newport Beach, Calif.

Filed Nov. 26, 1982, Ser. No. 444,549
Int. Cl.³ E21B 10/08
U.S. Cl. 384—94 4 Claims



1. Dynamic shaft seal means for rock bit bearings comprising:

at least one cantilevered bearing journal formed on a rock bit body,

a rock cutter element mounted to each said bearing journal and having a bearing surface formed therein that engagingly opposes said bearing journal,

a shoulder formed circumferentially about said bearing surface in said rock cutter element, said shoulder having substantially one radially extending surface and one axially extending surface,

an axially extending surface formed on an end of said journal proximal to said rock bit body and a radially extending surface formed on said rock bit body circumferentially about said journal, two said surfaces cooperating with said shoulder upon assembly of said rock cutter element to said journal to form a seal housing gland therebetween,

a resilient packing O-ring positioned within said seal housing gland, said O-ring having a durometer hardness of about Shore A80, and

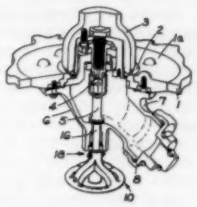
at least one back up ring positioned within said seal housing gland, said at least one back up ring being composed of a shape-memory metal alloy and having a radially planar shape, said shape-memory metal alloy is selected from the nickel-titanium alloy family known generically as nitinol, said shape-memory metal alloy becoming convex in cross section to axially compress said packing O-ring after exposure to a predetermined transformation temperature, said packing O-ring is substantially unconstrained axially, said packing O-ring is radially compressed by from about 4.0 percent to about 9.0 percent at assembly and is axially compressed by said back up ring when said back up ring is of convex cross section to a resultant total of about 10.0 percent to about 20.0 percent deformation.

4,429,855

HAND WHEEL FOR BOTTOM OPERATED TANK CAR VALVE

Angelo J. Buffone, Chesterfield, Mo., assignor to ACF Industries, Inc., New York, N.Y.

Filed Sep. 11, 1981, Ser. No. 301,179
Int. Cl.³ F16K 51/00
U.S. Cl. 251—144 10 Claims



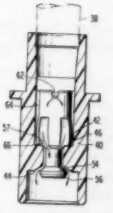
1. A connection arrangement for the lower portion of a tank bottom operating lading valve shaft wherein a tank lading valve is located within the tank and wherein the lading valve includes a downwardly extending operating shaft having a lower connection portion comprising: a hand wheel including an upper connection portion having a nonround slot to receive said operating shaft; hand wheel connecting means connecting the operating shaft to the hand wheel; said hand wheel including a body portion; said hand wheel body portion comprising a circumferential portion and a hub portion and wherein ribs extend between said circumferential portion and said hub portion; and wherein spaces are provided between said ribs; at least one nonround side opening extending through at least one of said ribs adapted to receive a generally horizontally extending operating tool; said hand wheel also including in its lower surface a bottom opening adapted to receive an operating tool whereby the attendant may utilize said ribs, said side opening and/or said bottom opening to rotate said hand wheel and said operating shaft to move said lading valve between open and closed positions.

4,429,856

INFLATION VALVE

Isaac S. Jackson, Greenwich, N.Y., assignor to Mallinckrodt, Inc., St. Louis, Mo.

Filed Dec. 18, 1981, Ser. No. 332,335
Int. Cl.³ F16L 37/28
U.S. Cl. 251—149.1 10 Claims



1. A two-piece valve comprising:

(a) a valve body having a longitudinal passage therethrough;

(b) said valve body being formed of a rigid material;

(c) said valve body including between the ends thereof an intermediate annular member extending inwardly from the wall of said passage and having a central opening therethrough;

(d) said annular member including a transverse wall at one

side thereof and a valve seat at the other side thereof, and having a predetermined longitudinal distance between said transverse wall and said valve seat;

(e) a valve element of flexible elastic material received within said longitudinal passage and movable therein;

(f) said valve element including an enlarged portion at one end, a valve-seat-engaging portion having a diameter greater than that of said central opening at the other end, and an intermediate portion of a diameter less than the diameter of said central opening;

(g) said valve element being compressible so that said valve-seat-engaging portion may be forced through said opening in said annular member and said enlarged portion may be compressed against said transverse wall; and

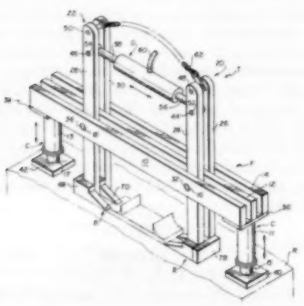
(h) the longitudinal distance between said transverse wall and said valve seat of said annular member exceeding the longitudinal distance between said enlarged portion and said valve seat-engaging portion of said valve element, whereby the resilience of said compressed enlarged portion urges said valve-seat-engaging portion firmly against said valve seat in sealing engagement.

4,429,857

APPARATUS FOR INTEGRALLY REMOVING A TRACK PLATE AND SPIKES

W. Gardner Ferguson, 2518 Broad Ave., Altoona, Pa. 16601

Filed Jan. 26, 1983, Ser. No. 461,002
Int. Cl.³ B25C *11/00*
U.S. Cl. 254—18 **13 Claims**



1. An apparatus for integrally removing a track plate and spikes secured to a tie, comprising:

(a) three parallel spaced longitudinally extending frame members, each of said frame members having opposed ends;

(b) bracket means secured to generally said frame members ends for fixedly aligning said frame members for defining a frame thereby;

(c) cylinder and piston means secured to said bracket means extending transversely of said frame and including a tie contacting portion and being adapted for reciprocally displacing said frame;

(d) each of said frame members having a pair of spaced apertures and each aperture of a frame member being aligned with an aperture of an adjacent frame member;

(e) a pair of arms pivotally secured to said frame and each of said arms having upwardly and downwardly extending portions, each of said arms including a pair of arm members and having one of said frame members disposed between said arm members;

(f) pin means pivotally securing said arms to said frame;

(g) opposed piston cylinder and piston means pivotally secured to said upwardly extending portion of each of said arms for reciprocally pivoting said arms; and,

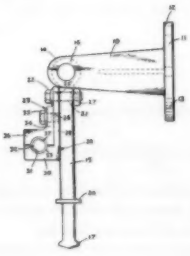
(h) opposed crowbar means secured to said downwardly extending portion of said arms each of said crowbar means including a tie contacting portion and a track plate contacting portion whereby said track plate contacting portion adapted for being positioned between said track plate and said tie by pivoting of said arms for displacing said track plate and said spikes and whereby said cylinder and piston means upwardly displacing said frame for integrally removing said track plate and said spikes from said frame.

4,429,858

ELECTRICAL TRANSMISSION SYSTEM CONDUCTOR INSTALLATION TECHNIQUE

David R. Dunbar, Wilmington, N.C., assignor to Interpace Corporation, Whippany, N.J.

Division of Ser. No. 139,048, Apr. 10, 1980, Pat. No. 4,312,495.
This application Nov. 2, 1981, Ser. No. 316,794
Int. Cl.³ B65H *59/00*
U.S. Cl. 254—134.3 PA **4 Claims**



1. In a power transmission system comprising a pole for supporting a line conductor, a suspension insulator having a first end connected with the pole and a second end extending from said pole in a downward and outward direction, and a strut insulator extending from said pole to form a junction with the suspension insulator at the second end thereof, the improvement being a conductor erection system comprising:

a bracket mounted to said junction of said insulators;

a connector suspended from said bracket, said connector having an upper end and a lower end;

a cable clamp detachably secured to said connector near said upper end thereof, said cable clamp having an aperture disposed with its axis parallel to the direction of said conductor and through which aperture a cable can be slid;

a cable secured by said cable clamp, both ends of said cable being attached to the line conductor, said cable being slidably disposed within said cable clamp for raising said conductor;

means for transferring load from the line conductor to said cable, said transferring means including a sheave assembly detachably securable to the lower end of said connector for temporary support of said conductor; and a conductor clamp securable to said line conductor for attachment of the line conductor to the lower end of said connector.

4,429,859

CONCENTRATED SOFTENING COMPOSITION FOR TEXTILE FIBERS

Jean-Pierre Steiner, Versailles; Christiane Melin, Courbevoie; Jean-Francois Platon, Courbevoie, and Nicole Peton, Ivry sur Seine, all of France, assignors to Lesieur-Cotelle & Associes, Boulogne Billancourt, France

Continuation of Ser. No. 262,269, May 11, 1981, abandoned. This application Feb. 18, 1983, Ser. No. 467,863
Claims priority, application France, May 14, 1980, 8010905
Int. Cl.³ D06M *13/20, 13/46*
U.S. Cl. 252—8.8 11 Claims

1. A concentrated softening composition for textile fibers comprising:

12 to 30% by weight of the total weight of the composition as an active cationic softening agent at least one quaternary ammonium compounds having the general formula

wherein R_1 is a carboxy alkyl group having from 10 to 22 carbon atoms,

R_2 is a carboxy alkyl group having from 10 to 22 carbon atoms,

R_3 is an alkyl group having 1 to 3 carbon atoms,

R_4 is an hydroxy alkyl group having 1 to 4 carbon atoms, and

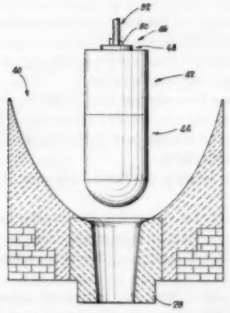
X is an anion selected from the group consisting of a halide, methylsulphate and ethylsulphate; at least one non-ionic emulsifying agent; one or more solvents selected from the group consisting of methanol, ethanol, isopropanol and glycol type solvents representing 5 to 12% of the total weight of the composition; said emulsifier and said solvent effective to give a viscosity below 400 mp/s to the mixed concentrate, a viscosity of 40–80 mp/s to the concentrate diluted by a 4:1 ratio, and improved stability to the softener composition.

4,429,860

RUNNER SYSTEM FOR TRANSFERRING MOLTEN METAL

John Fischley, Chagrin Falls, Ohio, and Tom E. Anderson, Munster, Ind., assignors to Republic Steel Corporation, Cleveland, Ohio

Filed Mar. 24, 1982, Ser. No. 361,206
Int. Cl.³ C21B *7/14*
U.S. Cl. 266—44 24 Claims



1. An apparatus for transferring molten metal during a smelting process from a blast furnace to bottle cars comprising:

(a) a main runner extending from the furnace to a downstream end;

(b) said main runner including a generally vertical opening through which molten metal can flow through into a first bottle car station beneath the main runner; and

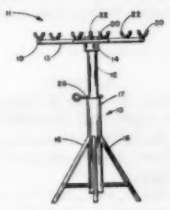
(c) a flow control means to block said opening so that when said opening is covered flowing molten metal will flow downstream past the opening and into another bottle car station near the downstream end of the main runner.

4,429,861

TOBACCO LEAF GRADING AND STRIPPING APPARATUS

Alfred P. Range, Rte. 14, Box 596, Johnson City, Tenn. 37601

Filed Nov. 19, 1980, Ser. No. 208,244
Int. Cl.³ B25B *1/20*
U.S. Cl. 269—40 2 Claims



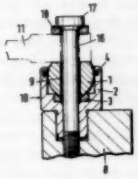
1. A tobacco leaf grading and stripping apparatus comprising base means, and tobacco stick hanger means rotatably mounted on said base means and comprising a plurality of individual arms extending outwardly from stanchion means in a spoke-like manner a distance close to or beyond the outer periphery of said base means, each of said arms being provided on its outer portions with support means, each said support means comprising a cross-member having cradle means thereon, the axes of adjacent cradle means of adjacent cross-members being in substantial alignment for jointly receiving and supporting both ends of a loaded tobacco stick in a generally horizontal posture.

4,429,862

APPARATUS FOR POSITIONING A WORKPIECE

Herbert Niedecker, Am Ellerhang 6, Königstein 2, Fed. Rep. of Germany 6240

Continuation of Ser. No. 2,928, Jan. 12, 1979, abandoned. This application Oct. 20, 1980, Ser. No. 198,882
Claims priority, application Fed. Rep. of Germany, Jan. 23, 1978, 2802791
Int. Cl.³ B23Q *1/00*
U.S. Cl. 269—47 6 Claims



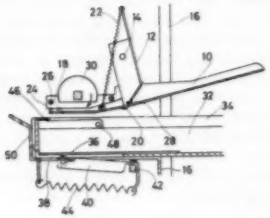
1. In a device for positioning and clamping workpieces in three dimensions, which are to be machined, comprising a carrier means carrying three positioning members and clamping means, the improvement wherein each of the positioning members comprises a spherical member having an upper flat plane surface for engaging a workpiece and a spherical seat for each spherical member, each spherical member being capable of limited rotational movement in its seat, at least one of the

spherical members having an axial bore and a bolt with a threaded end, said bolt projecting through said axial bore centrally through said upper flat plane surface of said one spherical member, said bolt engaging with its threaded end said carrier means, said bolt forming said clamping means comprising a bolt head having a spherical lower surface facing down, and a washer having a lower flat surface and an aperture surrounded by an upper spherical surface facing up for cooperation with said spherical lower surface of said bolt head, said bolt also projecting through the aperture of said washer and sitting with its spherical lower surface on the upper spherical surface of said washer for clamping a workpiece directly between the upper flat plane surface of said one spherical member and said lower flat surface of said washer, said washer aperture and said axial bore both having a diameter larger than said bolt for a positional adjustment between said clamping means and a workpiece with a hole through which the bolt extends.

4,429,863
MANUAL/AUTOMATIC PAPER FEED MECHANISM IN A COPYING MACHINE

Fukusaburo Itoh; Kazushige Mizumoto, and Yoshikazu Nishikawa, all of Nara, Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Sep. 2, 1981, Ser. No. 298,540
Claims priority, application Japan, Sep. 10, 1980, 55-126251
Int. Cl.³ B65H *3/44, 1/12, 3/06*
U.S. Cl. 271—9 **4 Claims**



1. A manual/automatic paper supply system for use in a copying machine comprising in combination:

a paper feed system including a paper feed roller;

a cassette holder for holding a copy paper cassette beneath said paper feed system;

biasing means for directing copy paper contained in said copy paper cassette toward an operating region of said paper feed roller;

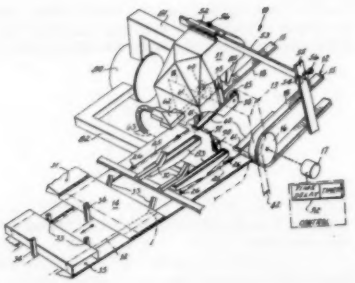
a paper supply means for the manual feed of individual sheets of copy paper to said copying machine juxtapositioned to said paper feed system above said cassette holder said paper supply means comprising a manual paper supply guide plate and a paper feed guide plate, said paper supply means being capable of occupying a first position such that said paper feed guide plate is located beneath said paper feed roller for conducting the manual supply of copy paper to said copying machine upon selection of a manual paper feed mode, and a second position such that said paper feed guide plate is displaced from said operating region of said paper feed roller means upon selection of an automatic paper feed mode; said paper supply system being rotatably secured to said copying machine such that said paper feed guide plate will pivot from said first position to said second position and back to said first position, into and out of the operating region of said paper feed roller in response to the selection of said manual or automatic mode of operation; and

a correlation means for disabling said biasing means when said paper supply means is located in said first position.

4,429,864
HIGH SPEED CARTON FEEDER

Eric W. Scarpa, Cincinnati, Ohio; Charles C. Hughes, Vila Hills, Ky., and Stanley F. Humbert, Cincinnati, Ohio, assignors to R. A. Jones & Co. Inc., Covington, Ky.

Filed Jun. 22, 1981, Ser. No. 276,081
Int. Cl.³ B65H *3/28, 5/22*
U.S. Cl. 271—10 **29 Claims**



9. Apparatus for feeding flat folded cartons into a cartoner comprising,

a generally horizontal conveyor for receiving a stack of cartons on their edges in a generally vertical orientation,

a metering wheel at the downstream end of and above said conveyor,

means for rotating said metering wheel from zero rpm to at least about 250 rpm,

means for driving the conveyor to advance said cartons toward said metering wheel,

a blade on the surface of said metering wheel said blade having a first section presenting a leading edge to slide between the upper edges of first and second leading cartons to thrust the edge of said carton forward from said stack to swing said cartons to a horizontal attitude,

said blade having a second section spaced slightly downstream of said first section and presenting a surface to hold back the upstream cartons,

said blade having a trailing edge spaced downstream from said leading edge for partially releasing said cartons,

a horizontal feed chain forward of said conveyor and having spaced feed lugs for receiving cartons one at a time and advancing them into said cartoner,

and a release plate downstream from said blade and formed as a part of a circle to capture cartons from said blade at low speeds and to release cartons in timed relation to said feed lugs on said chain.

12. Apparatus for feeding flat folded cartons into a cartoner comprising,

a generally horizontal conveyor for receiving a stack of cartons on their edges in a generally vertical orientation,

mechanical means for separating leading cartons from said stack, and

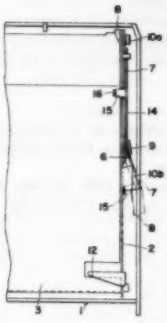
a blower means for delivering separated cartons through approximately 90° to a generally horizontal attitude to a receiving conveyor associated with said cartoner,

said mechanical means including a carton release member disposed adjacent said blower means for releasing cartons from said stack to be acted upon by said blower means

4,429,865
PAPER FEED DEVICE

Osamu Okada, Aichi, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Aug. 26, 1981, Ser. No. 296,356
Claims priority, application Japan, Sep. 11, 1980, 55-126792
Int. Cl.³ B65H 3/56
U.S. Cl. 271—170 7 Claims

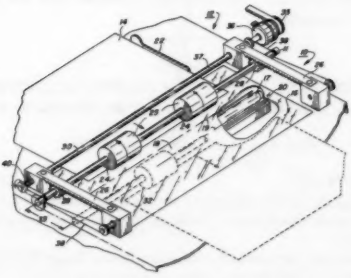


1. A paper feed device comprising:
a plate member for supporting a stack of sheets thereon;
separating pawls turnably supported for movement toward and away from the top sheet of the stack and for lightly pressing on each of the forward end corners of the stack when moved toward the stack to the limit of turning movement; and
means acting on the separating pawls as the pawls are turned away from the stack to a lifted position and displacing said separating pawls in a direction laterally away from the edge of the stack in response to the turning.

4,429,866
MOVING NIP CONSTANT VELOCITY DOCUMENT TRANSPORT

Victor Castro-Hahn, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 28, 1981, Ser. No. 315,791
Int. Cl.³ B65H 5/12
U.S. Cl. 271—266 8 Claims

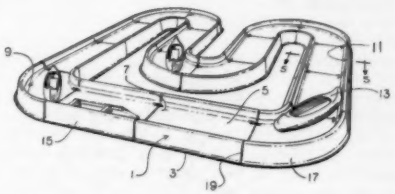


1. In a document transport apparatus for transporting an original document sheet over the imaging station at a transparent platen of a copier, the improvement comprising:
integrally movable roller unit means adapted to drivingly engage a document sheet on said platen from an initial position upstream of said imaging station, and
driving means to both rotate and translate said roller unit means relative to said platen and in engagement with a document sheet and so as to translate said roller unit means and a document sheet thereunder over and through said imaging station so that the roller unit means releases and ejects the document sheet trail edge downstream of said imaging station and after both said roller unit means and the document sheet have passed over and beyond said imaging station without imaging the roller unit or rubbing said transport platen with said roller unit in said imaging station and wherein said rotational movement of said roller unit means advances the lead edge of a document ahead of it before it enters the imaging station.

4,429,867
FLOTATION AMUSEMENT DEVICE

Jerry L. Barber, Greenville, S.C., assignor to Wayne P. Comstock, Greenville, S.C., a part interest

Filed Nov. 3, 1981, Ser. No. 317,769
Int. Cl.³ A63G 3/00
U.S. Cl. 272—32 8 Claims

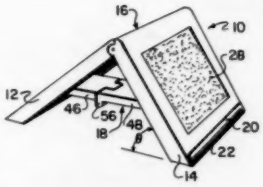


1. A portable amusement device, comprising:
a plurality of trough defining segments;
each of said trough defining segments being formed with double side walls and end walls with said double side walls defining a hollow section to permit nesting of individual segments for shipment and storage;
means for joining said segments to one another to form a continuous trough;
pump means in at least one hollow section connected to said trough for mov ing an aqueous flotation medium through said continuous trough.

4,429,868
CALF STRETCHING DEVICE

James S. LeBlanc, San Diego, and Alan K. Uke, Solana Beach, both of Calif., assignors to Paraflexor, San Diego, Calif.

Filed Sep. 3, 1981, Ser. No. 299,022
Int. Cl.³ A63B 23/04
U.S. Cl. 272—93 10 Claims



1. A device to aid a person using the device in stretching his or her calves, comprising:
a pair of generally rectangular members each having an upper side, a lower side, a first longitudinal edge and a second longitudinal edge opposite the first longitudinal edge, at least one of the upper sides being dimensioned so that the distance between the first longitudinal edge and the second longitudinal edge is substantially equivalent to the length of the feet of the person using the device and so

that it has sufficient area to support both of the person's feet;

hinge means for connecting the members along their first edges and permitting relative swinging movement of the members; and

linkage means connected between the lower sides of the members for permitting the members to swing together and for limiting the amount that the members can swing apart so that when the second edges of the members rest on a floor, the one upper side will be inclined at a predetermined desired angle with respect to the floor;

whereby the person may stand on the one upper side with both of his or her feet upwardly inclined moving from heel to toe and his or her calves will be stretched.

4,429,869

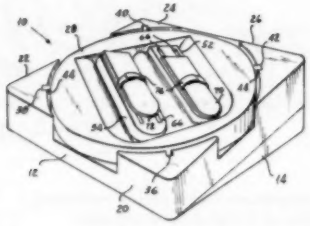
SKIER'S EXERCISE DEVICE

Arthur Eckstein, 47 Pinetree La., Roslyn Heights, N.Y. 11577

Filed Oct. 15, 1981, Ser. No. 311,775

Int. Cl.³ A63B *69/18*

U.S. Cl. 272—97 **5 Claims**



1. Skier's exercise apparatus including in combination a turntable formed with a pair of generally parallel spaced elongated troughs, means mounting said turntable for rotary movement around a pivot axis located between said troughs, a pair of intermediate supports, means mounting said supports in said troughs for rotary movement around axes extending generally longitudinally of said troughs, a pair of foot-receiving plates, and means mounting said plates respectively on said supports for fore-and-aft sliding movement in the direction of said support axes.

4,429,870

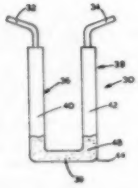
PHYSICAL EXERCISING APPARATUS

Thomas T. Gibbs, 1539 Edgeware Rd., Victoria, British Columbia, Canada V8T 2J6

Filed Jan. 27, 1981, Ser. No. 228,763

Int. Cl.³ A63B *21/06*

U.S. Cl. 272—117 **6 Claims**



1. An exerciser comprising:

(a) a pair of elongate, parallel members having adjacent first ends and adjacent second ends opposite the first ends,

(b) a pair of handle members near the first ends of the parallel members, the handle members being elongate and extending outwardly from the parallel members and away from each other, a weight member, each of said handle members comprising tubes with equal outside cross-sectional extents, the exerciser further comprising a cylindrical bearing surface on each said parallel member between the handle members and the weight member, the bearing surfaces having outside cross-sectional extents substantially greater than the outside cross-sectional extents of the handle member; said exerciser being gripped and moved doing various exercises, said bearing surface engaging the shoulders of a user; and

(c) said weight member interconnecting the parallel members near the second ends thereof and said weight member being substantially heavier than the parallel members.

4,429,871

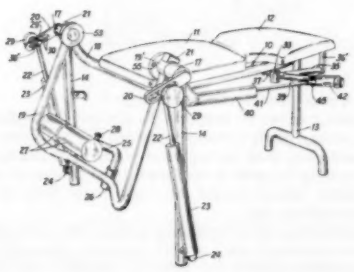
HYDRAULIC EXERCISER

Paul F. Flechner, Costa Mesa, Calif., assignor to AMF Incorporated, White Plains, N.Y.

Filed Nov. 12, 1981, Ser. No. 320,365

Int. Cl.³ A63B *21/10*

U.S. Cl. 272—130 **25 Claims**



1. An exercise device, comprising a table, an exercise station at opposite ends of said table, said table being adapted to have a user of said exercise device seated at either end thereof or prone thereon in either lengthwise direction of said table, input exercise arms having hydraulic cylinder means for exerting a resistance to only one direction of motion connected to each input arm for resisting the motion of that arm in one direction at each of said stations, and said arms and cylinders being adapted at one of said stations for knee extension, leg curl, chest pull-over and chest press exercises, and at the other station for leg scissor, hip extension, shoulder raise and back pull-down exercises.

4,429,872

FOUL OR BASE LINES FOR ATHLETIC ACTIVITIES

Nickolas E. Capachi, 2459 Moorbrook Way, Sacramento, Calif. 95826

Filed Aug. 5, 1981, Ser. No. 290,111

Int. Cl.³ A63B *71/02*

U.S. Cl. 273—25 **6 Claims**

1. A foul or base line segment of plastic or rubberized material suitable for installation in various fields of athletic activities comprising:

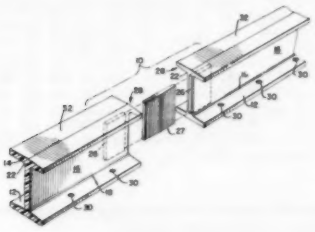
a. a generally horizontally extending lower flange for installation in a field beneath ground or playing level;

b. a generally horizontally extending upper flange which upon installation will be clearly visible at ground or playing level to demarcate fair and foul zones or areas, for example;

c. an intermediate web extending generally vertically between said lower and said upper flanges and having a lower edge integral with said lower flange at about the transverse midsection of said lower flange, an upper edge integral with said upper flange at about the transverse

midsection of said upper flange, and retaining means formed in at least one end of said web; and

d. coupling means enclosed within and cooperating with said retaining means to couple said one end of said web to



an end of a like foul or base line segment placed end-to-end with said foul or base line segment to extend it and to ensure installation at substantially the same level or height.

4,429,873

TENNIS RACKET

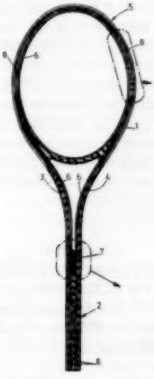
Joris Van Raemdonck, Bazel, Belgium, assignor to Snauwaert En Depla N.V., Roeselare, Belgium

Filed Aug. 12, 1981, Ser. No. 292,246

Claims priority, application Belgium, Aug. 13, 1980, 201742

Int. Cl.³ A63B *49/10, 49/12*

U.S. Cl. 273—73 F **11 Claims**



1. Tennis racket comprising:

a frame;

a shaft;

said frame and said shaft being formed by synthetic fibres or synthetic resin-impregnated fibres;

an inner core, made of synthetic foam, encompassed by said fibres and at least one wooden layer reinforcing said synthetic foam;

a one portion of side of said at least one wooden layer in contact with said fibres; and

a portion of the other side of said at least one wooden layer in contact with said foam core.

4,429,874

GAME RACQUET FRAME

Robert E. Rodgers, Jr., Houston, Tex., assignor to Leach Industries, Inc., San Diego, Calif.

Division of Ser. No. 77,274, Sep. 20, 1979, Pat. No. 4,331,331.

This application Aug. 31, 1981, Ser. No. 298,261

Int. Cl.³ A63B *49/10, 49/12*

U.S. Cl. 273—73 C **1 Claim**

1. A game racquet comprising a preformed unitary synthetic plastic frame member having integral defined head and throat portions and a solid integral handle end portion, said head including a yoke extending adjacent the throat to complete a closed perimeter for the stringing area, a metal channel member having, in cross-section, a generally U-shaped configuration defined by a planar bottom wall and a pair of planar side walls, said bottom wall having a flat inner surface extending across the entire width thereof and said side walls having flat inner surfaces extending the entire length thereof, said metal channel member snugly extending over the outer periphery and opposite sides of said plastic frame member, said plastic frame member being in the form of an inverted T with the stem of the T abutting the flat inner surface of the bottom wall of said channel member, and with the lateral flanges of the T extending into abutment with and adhesively secured to said side walls of said channel member, and a bumper strip adhesively bonded upon and along the outer periphery of said channel member at least at said head portion.

4,429,875

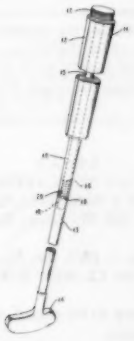
GOLF CLUB

Robert Stanton, Rte. 44, Millbrook, N.Y. 12545

Filed Sep. 30, 1982, Ser. No. 429,065

Int. Cl.³ A63B *53/12*

U.S. Cl. 273—81.2 **4 Claims**



1. A golf club comprising:

upper and lower tubular sections wherein said upper tubular section has a grip at one end and said lower tubular section has a head at one end requiring a predetermined alignment with said grip;

a coupler including upper and lower parts, said lower part being inserted in said lower tubular section at the end opposite said head and said upper part being insertable in

the lower end of said upper tubular section opposite said grip;

a shaft inserted in said upper tubular section including exterior threading at its lower end and a shoulder at its upper end;

said upper part of said coupler including interior threading cooperating with said exterior threading of the lower end of said shaft whereby coupling can be made by inserting said upper part of said coupler into the lower end of said upper tubular section and screwing said shaft into said coupler until said shoulder of said shaft is tight against said grip at the upper end of said upper tubular section; and

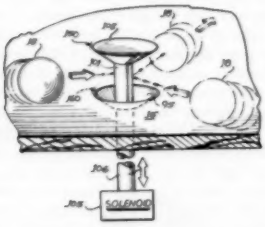
aligning means including means integrally associated with said upper part of said coupler, and cooperating means associated with the lower end of said upper tubular section.

4,429,876

PINBALL MACHINE AND PLAY FEATURE THEREOF

Ronald D. Halliburton, Delray Beach; James H. Pearson, Oakland Park, and Robert J. Sava, Miramar, all of Fla., assignors to Bally Manufacturing Corporation, Chicago, Ill.

Filed Dec. 24, 1981, Ser. No. 334,316
Int. Cl.³ A63F *7/02, 7/30*
U.S. Cl. 273—121 A **10 Claims**



1. A drop target for use in conjunction with a playfield and a ball, comprising: a target member having a post and a flange atop the post, first means for positioning the flange and a portion of the post above the playfield so as to position the target in an up position responsive to a control stimulus and second means for positioning the target beneath and flush with the playfield so as to allow the ball to pass thereover unobstructed responsive to the collision of the ball from any direction with the target when the target is in the up position.

4,429,877

GAME OF CHANCE TO BE PLAYED IN CONJUNCTION WITH A BASEBALL GAME

C. Wallace Coppock, 920 Ely Blvd., South, Petaluma, Calif. 94952

Filed Jun. 1, 1982, Ser. No. 383,739
Int. Cl.³ A63F *9/00*
U.S. Cl. 273—139 **9 Claims**

1. A game of chance to be played in conjunction with a baseball game comprising:

a game card having a row of spaces delineated thereon to represent possible activities in an inning of a baseball game in play;

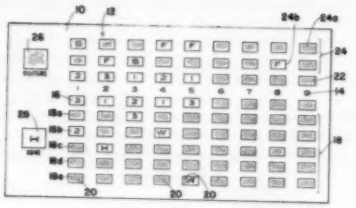
one of three first marks in a first one of said spaces;

said one first mark representing one of the three players of one team certain to bat in a given inning;

at least one second space;

a second mark in each second space;

each of said second marks indicating one of several accomplishments of a baseball player during a turn at bat; and



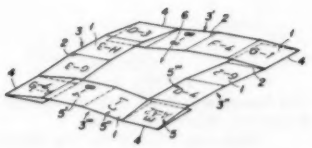
a removable mask covering each space in said row thereof to render a mark therein invisible.

4,429,878

FOLDABLE PUZZLE CARDS

Noriji Asao, 607, Fuchu-cho, Fuchu-shi, Hiroshima-ken, Japan

Filed Oct. 15, 1981, Ser. No. 311,616
Int. Cl.³ A63F *9/08*
U.S. Cl. 273—155 **5 Claims**



1. A foldable puzzle card comprising four elongated rectangular strips, each including four equal card boards which are foldably connected with each other, said four strips being disposed to form a rectangular frame, and means for foldably interconnecting end card boards on both sides of one strip with end card boards on both sides of the other two strips extending perpendicularly to said one strip so as to cause interconnected end card boards of said one strip and of the other strips to overlap each other, front and rear surfaces of each card board being provided with predetermined patterns whereby by suitably folding said strips a desired pattern can be formed with patterns formed on said card boards.

4,429,879

SOLE PLATE INTERNAL SUSPENSION IN METAL SHELLS TO FORM METAL WOODS

Glenn H. Schmidt, 1857 Los Encinos, Glendale, Calif. 91208

Filed Apr. 5, 1982, Ser. No. 365,148
Int. Cl.³ A63B *53/04*
U.S. Cl. 273—167 H **4 Claims**

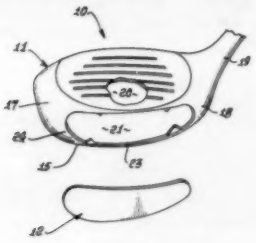
1. A golf club head having a hollow metal shell defining a front wall, a bottom wall, and top and back sides, said bottom wall having an opening therein, a metallic sole plate attached to said bottom wall thereby closing said opening and forming a hollow golf club head, the combination comprising:

(a) ledge structure integral with the shell and adjacent a rim formed by said opening so that the ledge structure is in the shell hollow, in offset relation to the rim, said ledge structure defined by multiple ledges spaced about said opening and spaced apart from one another, and projecting toward the central region of said opening, said ledges spaced apart in pairs at opposite sides of an upright plane bisecting the head in a front to rear direction,

(b) the sole plate located in said opening and supported solely

by portions of said ledges spaced from said rim to have close peripheral spacing from the rim,

(c) the sole plate being peripherally connected to the shell rim by weld material which fills the spaces between the sole plate and the rim and engages said ledges,



(d) upright ribs integrally formed with said front wall, at least a first two of said ledges defined by the lower terminals of said ribs, and

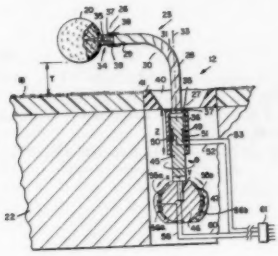
(e) said ledges spaced from the outer surface of said bottom wall and toward the hollow interior of the shell so that the sole plate outer surface is flush with said bottom wall outer surface.

4,429,880

GOLF GAME SIMULATOR DEVICE

Richard M. Chen, 51-25 Goldsmith St., Elmhurst, N.Y. 11373, and Marvin Feldman, 788 Columbus Ave., New York, N.Y. 10025

Filed Jul. 31, 1981, Ser. No. 289,051
Int. Cl.³ A63B *69/36*
U.S. Cl. 273—176 FA **18 Claims**



17. A golf simulator comprising:

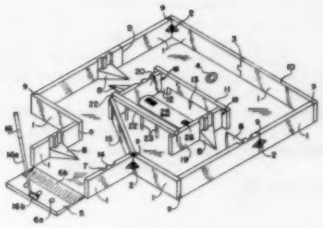
means to mount a golf ball so that the ball can be struck by a golf club in putting, chipping, or driving; said mounting means comprising means to permit movement of said mounting means in response to the impact of the club on said ball; means operably interconnected to said golf ball mounting means to actuate a first electrical signal responsive to the movement of the mounting means upon impact of the ball and a second electrical signal at a finite time after said impact; computer means to compute the difference in said signals so as to provide data for said ball as if the ball were in respective putting, chipping, or driving movement, said data including golf ball loft data from said signals from said movement; means to input golf course data comprising fairway and green images to said computer so that said computer computes said golf course data and said golf ball putting, chipping or driving movement data; and visual display means to visually display the fairway and green images and the golf ball data being disposed on the fairway or green image.

4,429,881

PORTABLE GOLF GAME

Kenneth A. Barrett, 110 Pine St., Florence, Northampton, Mass. 01060

Filed Sep. 2, 1981, Ser. No. 298,782
Int. Cl.³ A63B *69/36*
U.S. Cl. 273—176 F **15 Claims**



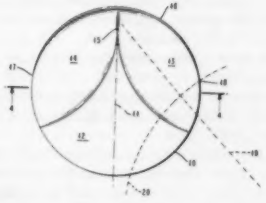
1. A portable golf game comprising of an outer perimeter fence formed in the shape of a rectangle, consisting of modular rectangular blocks hinged together by strap means on each side thereof and of a height to contain a conventional golf ball, a starting area having a rectangular block fence on each side connected to the perimeter fence, an opening in said perimeter fence whereby a golf ball may enter within the perimeter of said fence from the said starting area, a tongue and groove means for interconnecting the perimeter fence to the rear of the rectangular block of the starting area, a middle section located within the center area of the inside of said perimeter fence, said middle section having a first tunnel board parallel to the rear fence, a left leg parallel to the left outside fence, a right leg parallel to the right outside fence, said right leg and said left leg connected to said tunnel board, and of the same height as said outside fence, means for rigidly securing said legs to said tunnel board, whereby three fairways are formed, and a circular plate of the size of a golf ball simulating a hole whereby the ball may be contained therewithin, said perimeter fence being in five hinged connected segments on each side thereof whereby said sections may be folded up and stored in a small area adapting same to being easily assembled, disassembled and carried out to different locations.

4,429,882

GOLF PUTTING TARGET

Robert Stanton, Rte. 44, Millbrook, N.Y. 12545

Filed Sep. 30, 1982, Ser. No. 429,066
Int. Cl.³ A63B *69/36*
U.S. Cl. 273—177 R **2 Claims**



1. A golf putting target comprising:

a solid circular base;

a vertical back wall integral with said base and extending around a portion of the circumference of said base;

said base having increasing thickness from the front thereof to the back along a center line corresponding with the path of

a properly putted golf ball and forming an upward slanting flat ramp, said ramp decreasing in width from the front of said base to the back; and

a downward sloping ramp on both sides of said center line from the top of said upward slanting ramp on said base to the side of said base, whereby the intersection of said upward slanting flat ramp and said downward sloping ramps form a ridge along said center line.

4,429,883

LABYRINTH SEAL CONSTRUCTION

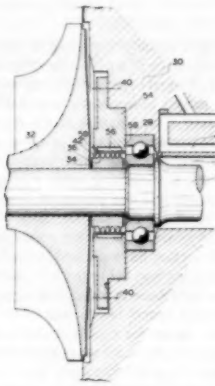
Keiichi Nakanishi, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Continuation of Ser. No. 141,971, Apr. 21, 1980, abandoned. This application Aug. 19, 1981, Ser. No. 294,386

Claims priority, application Japan, May 8, 1979, 54-60125[U]

Int. Cl.³ F01D *11/08*

U.S. Cl. 277—53 **3 Claims**



1. A labyrinth seal construction arranged in a device having a housing and a rotatable shaft which is rotatable about its axis relative to said housing, said labyrinth seal construction comprising:

a first annular metal member spacedly and coaxially disposed about said rotatable shaft and secured to said housing;

a second annular metal member coaxially and securely disposed on said rotatable shaft to define an annular gap between the inner cylindrical surface of said first annular metal member and the outer cylindrical surface of said second annular metal member, one of said first and second annular metal members being formed at the cylindrical surface facing toward the annular gap with an annular groove leaving two spaced annular side banks by which said annular groove is defined, said annular groove being coaxial with the rotatable shaft;

a resilient metal sleeve consisting of a single plate having a width sufficient to span said spaced side banks of the grooved metal member and being coaxially and securely disposed on the tops of said side banks so as to enclose said annular groove; and

a plurality of annular projections formed on the cylindrical surface of the other one of said first and second annular metal members to project toward the cylindrical surface of said resilient metal sleeve so that upon rotation of said rotatable shaft, relative rotation between said annular projections and said resilient metal sleeve occurs with tops of said annular projections directed toward the cylindrical surface of said resilient metal sleeve to provide a labyrinth seal effect therebetween.

4,429,884

STERN TUBE FACE SEAL WITH FUNNEL-SHAPED PACKING

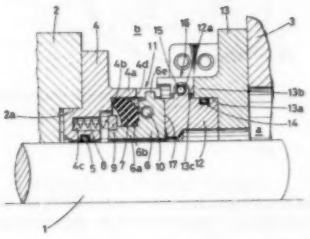
Sotosuke Matsumoto, Kawagoe, Japan, assignor to Eagle Industry Co., Ltd., Tokyo, Japan

Filed Mar. 9, 1983, Ser. No. 473,487

Claims priority, application Japan, Mar. 17, 1982, 57-40728

Int. Cl.³ F16J *15/38*

U.S. Cl. 277—93 SD **1 Claim**



1. A stern tube seal characterized in that an annular housing fitted in a rotating shaft is integrally formed with an axially and rearwardly extending flange, a rotatable and slidable ring having a section of approximately L-shape and a small diameter portion at a front end thereof is arranged at an inner peripheral position of said flange, said rotatable and slidable ring and said flange of said housing having engaging means to prevent relative movement in a rotating direction, said rotatable and slidable ring is biased by means of coiled springs axially and frontwardly, and a packing having a shape of approximately funnel formed of an elastic material such as rubber is interposed between a shoulder portion in the outer periphery of said rotatable and slidable ring and a shoulder portion in the inner periphery of the flange of said housing.

4,429,885

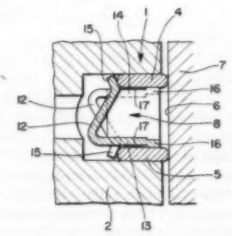
SPACER AND EXPANDER MEMBER FOR HOLDING AND BIASING PISTON RING RAILS

Ko Chiba; Hajime Yamauchi; Yoneo Kawauchi, and Yukio Ikeda, all of Kashiwazaki, assignors to Kabushiki Kaisha Riken, Tokyo, Japan

Filed Nov. 4, 1982, Ser. No. 439,177

Int. Cl.³ F16J *9/06, 9/20*

U.S. Cl. 277—140 **3 Claims**



1. A piston ring assembly comprising a pair of rails having cylinder-engaging rounded faces and a spacer and expander member for holding said rails in axially spaced relation and for expanding said rails radially outwardly, said spacer and expander member being constructed of corrugated sheet metal having upper and lower crowns and connecting portions continuously connecting said crowns, each said upper crown being provided at its inner portion with an arm extending downwardly to engage the inner periphery of said rail supported on

said lower crown, each said lower crown being provided at its inner portion with an arm extending upwardly to engage the inner periphery of said rail supported on said upper crown, each said arm being tapered in width and provided at its tip with an enlarged rail receiving portion, said arms extending alterntely upwardly and downwardly from said lower and upper crowns and being inclined radially outwardly to provide a resilient spring-like action, the rail receiving portions of said arms being inclined radially inwardly.

4,429,886

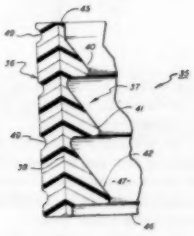
FLEXIBLE PIPE GASKET

Robert C. Buttner, Syracuse, N.Y., assignor to Concrete Pipe & Products Corp., East Syracuse, N.Y.

Filed Sep. 29, 1982, Ser. No. 426,928

Int. Cl.³ F16S *15/32*

U.S. Cl. 277—207 A **8 Claims**



1. A resilient gasket for providing a fluid tight seal between a concrete pipe and the wall of a circular receiving hole formed in a second concrete member, said gasket including

an outer ring having a smooth outside diameter that is at least as large as the diameter of the receiving opening and an inside diameter that is greater than the pipe diameter, said ring being formed of a resilient material having a mass that is sufficient to support the ring in a circular condition within the hole and apply a deforming pressure to compress the ring against the wall of the hole about the entire periphery thereof, the resiliency of said ring being such as to permit the ring to be collapsed inwardly upon itself so that it may be inserted and removed from the hole, and

an inner finned section axially aligned within the ring having a plurality of axially spaced circular fins disposed inwardly into a central opening, each fin having an inside diameter that is less than said outside diameter of the pipe, said fins also being formed of a resilient material so that added sealing pressure is applied to the ring when the pipe is passed into the opening.

4,429,887

4-JAW WORK HOLDING LATHE CHUCK

Bernard Smith, 33 Bagshawe Avenue, Chapel-en-le-Frith, Stockport, Cheshire SK12 6SE, England

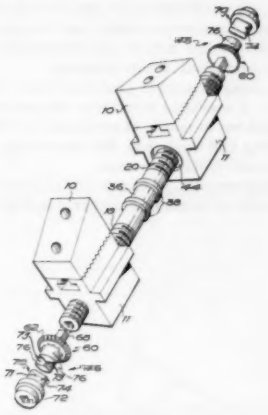
Filed Nov. 3, 1981, Ser. No. 317,860

Claims priority, application United Kingdom, Nov. 29, 1980, 8038413; Apr. 8, 1981, 8111074

Int. Cl.³ B23B *31/16*

U.S. Cl. 279—112 **8 Claims**

1. A 4-jaw work holding rotary chuck comprising a body part with oppositely disposed radiating guides; respective jaws slidably adjustable along said guides; a pair of adjusting screws extending diametrically across the body part and each extending through a pair of opposed jaws, each adjusting screw having a right-hand thread at one end and a left-hand thread at the other end for adjusting the respective pair of jaws with equal and opposite movement, the adjusting screws being disposed in mutually offset planes and crossing each other at the axis of the chuck so that each adjusting screw can be operated independently of the other for adjusting the associated pair of jaws relative to the other pair; means for effecting a relative adjustment of one of each pair of jaws relative to the other jaw of such pair, said means being operable independently of said adjusting screws and comprising a pair of sleeves associated with respective ones of the adjusting screws, each sleeve being mounted on one end of its associated adjusting screw and being internally screwthreaded for engaging the screwthread at that end of the screw and externally screwthreaded, with a screwthread of opposite hand, for engaging the jaw which is mounted on that end of the screw; a pair of lockable driving means for rotatably driving respective ones of said sleeves, each driving means comprising a rotary driving member arranged for non-rotatably engaging said body part of



the chuck and being movable relative to its associated sleeve out of non-rotary engagement with said body part; spring means for yieldably urging said driving member into non-rotary engagement with said body part; and a pair of rotatable torque applying means being provided for rotating said driving members, each torque applying means comprising a driving surface arranged in lost motion rotary driving connection with a driven surface of the associated spring loaded driving member, and cam means on said associated torque applying means for engaging and displacing said driving member along the axis of the associated sleeve and out of non-rotary engagement with said body part during lost motion rotation of said driving surface relative to said driven surface so that said driving member becomes rotatable by said driving surface.

4,429,888

TOY DUMP TRUCK

Shane-Mau Wu, 107 Shin An Rd., Shihlin, Taipei, Taiwan

Filed Dec. 22, 1981, Ser. No. 333,436

Int. Cl.³ B62K *9/00*

U.S. Cl. 280—1.11 R **8 Claims**

8. A ridable toy dump truck comprising:

a frame;

plural wheels journaled to said frame for supporting said dump truck for rolling movement across a surface;

a dump bed, pivotably mounted on said frame, for moving between a raised position and a lowered position;

drive train means, manually operably by a rider, for providing a driving force to predetermined one of said wheels to move said dump truck across said surface and to move said dump bed between said raised and lowered positions, said drivetrain means including:

a rotatable drive shaft;

input means, journaled to said drive shaft, for allowing said rider to induce said drive shaft to rotate, said input

means comprising pedal means, journaled to said frame, for accepting force manually applied by the feet of said rider;

propulsion means, journaled to said drive shaft, for transmitting driving force to said predetermined ones of said wheels; and

dumping means, journaled to said drive shaft, for transmitting force to move said dump bed between said raised and lowered positions;

clutch means, operably associated with said drive train means and manually operable by said rider, rotatable with said drive shaft and reciprocally movable to a go position or to a dump position, for engaging said propulsion means while in said go position to effect operative union between said propulsion means and said drive shaft, and for engaging said dump means while in said dump position to effect operative union between said dump means and said drive shaft, said clutch means including

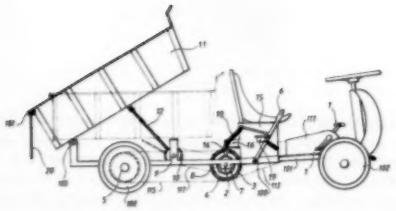
a propulsion sprocket, journaled to said drive shaft, capable of rotational movement independent of said drive shaft but incapable of substantial rectilinear movement along said drive shaft, for transmitting rotational force to said propulsion means;

a dump sprocket, journaled to said drive shaft, capable of rotational movement independent of said drive shaft but incapable of substantial rectilinear movement along said drive shaft, for transmitting rotational force to said dumping means;

a sleeve, journaled to said drive shaft, located between said propulsion sprocket and said dump sprocket, for moving in a reciprocal rectilinear motion along said drive shaft to contact said propulsion sprocket or said dump sprocket;

first mating means for selectively coupling said sleeve with said propulsion sprocket including a first plurality of protrusions extending from a surface of said propulsion sprocket, and a second plurality of protrusions extending from a surface of said sleeve, said second plurality of protrusions being disposed on said sleeve surface to engage said first plurality of protrusions when said sleeve is brought in contact with said propulsion sprocket; and

second mating means for selectively coupling said sleeve with said dump sprocket, including a third plurality of protrusions extending from a surface of said sleeve, and an annulus concentrically disposed with and fixed to said dump sprocket, said annulus defining a plurality of indentations disposed in said annulus to engage said third plurality of protrusions when said sleeve is brought in contact with said dump sprocket.



4,429,889

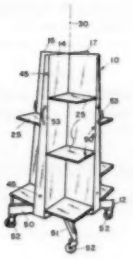
STACKING CART

Dan P. Westra, Grand Haven, Mich., assignor to The Challenge Machinery Company, Grand Haven, Mich.

Filed Feb. 8, 1982, Ser. No. 346,758

Int. Cl.³ B62B *3/10*

U.S. Cl. 280—79.1 A **21 Claims**



1. A stacking cart for sheet material comprising:

a generally horizontally extending movable stand having a centrally located vertical axis;

a plurality of vertically oriented, substantially identical, troughs having first and second sides defining a generally V-shaped cross section, said V-shaped trough being disposed on said stand, said V-shaped troughs being provided with top ends and lower ends;

a plurality of generally horizontally extending shelves disposed in said V-shaped troughs;

means for mounting said shelves to extend in a direction generally orthogonal to said first and second sidewalls of said V-shaped troughs;

means for securing said V-shaped troughs in a back-to-back relationship, each of said V-shaped troughs being disposed in an inclined relationship with respect to said centrally located vertical axis, said top ends of said V-shaped troughs being inwardly disposed relative to said lower ends of said troughs, whereby paper products disposed on said shelves are gravity biased inwardly toward said centrally located axis; and

said means for securing said v-shaped troughs in back-to-back relationship comprising at least one vertically oriented flange disposed on one of said first and second sides of said V-shaped troughs.

4,429,890

FOLDABLE AND PORTABLE VEHICLE

David T. Hon, Los Angeles, Calif., assignor to Hon Corporation, Los Angeles, Calif.

Division of Ser. No. 233,624, Feb. 12, 1981. This application Sep. 29, 1982, Ser. No. 427,433

Int. Cl.³ B62M *1/02;* **B62K** *15/00*

U.S. Cl. 280—259 **15 Claims**

1. In a foldable and portable bicycle, a pedal/sprocket assembly comprising:

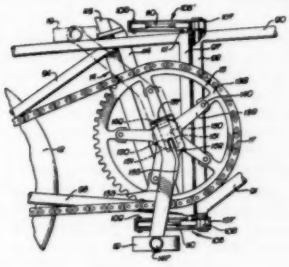
a crankshaft rotatably mounted on the bicycle to rotate about a sprocket axis and having opposite ends disposed along opposite sides thereof, and a sprocket mounted on said crankshaft on one side of the bicycle;

two cranks having inner end portions overlying the opposite ends of said crankshaft and having outer end portions extending generally radially outwardly from the crankshaft along said opposite sides in normal operating positions, each of said cranks having a pedal on its radially outer end projecting laterally outwardly therefrom;

means drivingly connecting each of said cranks to said crankshaft to turn the latter and said sprocket, and also for folding from said normal operating positions generally reversely

across the crankshaft to folded positions in which said pedals project laterally inwardly;

each of said cranks having a bend between the inner and outer ends portions thereof offsetting the outer end portion rearwardly from a true radial position whereby the crank folds



into a folded position that is other than directly opposite the normal operating position, for location of the inwardly projecting pedal on the bicycle;

and means for latching each pedal releasably in the normal operating position.

4,429,891

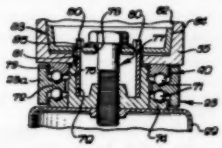
FOLDABLE AND PORTABLE VEHICLE

David T. Hon, Los Angeles, Calif., assignor to Hon Corporation, Los Angeles, Calif.

Division of Ser. No. 233,624, Feb. 12, 1981. This application Sep. 29, 1982, Ser. No. 427,556

Int. Cl.³ B62K *15/00, 21/06*

U.S. Cl. 280—278 **8 Claims**



1. A foldable and portable bicycle comprising:

a foldable frame having a front end;

a handlebar assembly normally extending upwardly from said front end and supported for folding into a lowered position below said front end;

a front wheel support extending downwardly from said front end to support a front wheel of the bicycle;

connecting means joining said handlebar assembly to said front wheel support;

a steering bearing rotatably supporting said handlebar assembly and said front wheel support on said frame, said bearing comprising a narrow arcuate housing secured to said front end and forming a front wheel support and bearing housing; and

bearing elements in said housing between the latter and said connecting means, said bearing having relatively short axial length and a diameter substantially greater than said axial length whereby the bearing reduces the folded height of the frame while remaining effective to sustain the loads encountered in use.

4,429,892

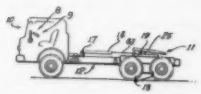
SLIDING FIFTH WHEEL

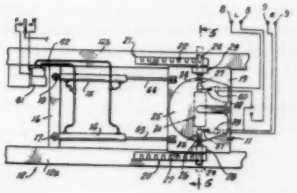
William H. Frampton, 17119 Clarkdale, Artesia, Calif. 90701, and Alfred M. Bos, 10123 Palm St., Bellflower, Calif. 90706

Filed Jun. 25, 1981, Ser. No. 277,247

Int. Cl.³ B62D *53/08*

U.S. Cl. 280—407 **6 Claims**





1. A device for attachment to a tractor for selectively moving the fifth wheel assembly with respect to the drive wheel of the tractor, said tractor having a frame including a cross member, two side rails, each side rail having a guide member which holds one side of a fifth wheel platform in a manner which allows longitudinal movement of the platform, the guide members also having locking means, said device comprising:

a first drive member affixed at one end to said cross member held by the two side rails and at the other end to the fifth wheel platform;

a second drive member affixed at one end to a cross member held by the two side rails and at the other end to the fifth wheel platform;

means for selectively extending or contracting the first and second drive members, said means for extending or contracting having activating means located in the cab of the tractor rig; and

locking means affixed to said fifth wheel platform and to the side rails of the tractor comprising a first row of lock notches affixed to one of the side rails of the tractor frame and a second row of lock notches affixed to the other of the two side rails of the tractor frame and a pair lock lug means affixed to lock bars which lock lug means are moveable between a first position in which each lock lug is held by at least one of the lock notches in each of the rows and a second position where the lock lugs are disengaged from any of the lock notches in both rows; and

indicator means located in the cab of the tractor to indicate when said locking means of the fifth wheel assembly are in a locked or unlocked configuration, whereby the operator may unlock the fifth wheel assembly, activate the first and second drive members to cause the drive members to extend or contract and cause the platform to slide with respect to the drive wheel and lock the fifth wheel assembly without leaving the cab of the tractor and without locking the wheels of the trailer.

4,429,893

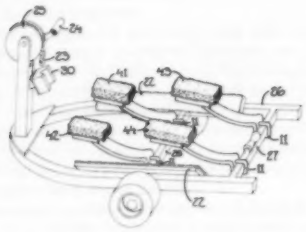
BOAT TRAILER

Anthony Palamara, 7559 Calle Granada, Anaheim, Calif. 92807

Filed Apr. 5, 1982, Ser. No. 365,503

Int. Cl.³ B60P *1/46*

U.S. Cl. 280—414.1 **4 Claims**



1. A boat trailer with cross member means, padded means located on both sides parallel to the sides of the trailer and five inches above the wheels to permit said cross member means to contain the boat hull in a final resting position, four automotive leaf springs 40 inches long, one end bent at a 90 degree angle and fastened with attachment means to the outside one-third of the cross members of the trailer, the unattached end tilted inward and attached to padded block means which interact with the boat hull urging it inward toward the center during launching and recovery, and winch means to haul the boat into final position on the trailer.

4,429,894

FASTENING DEVICE FOR A TRAILER AND TRAILER COMPRISING SUCH A DEVICE

Alain Feuvray, 21 rue de Lattre de Tassigny, 71100 Chalon sur Saone, France

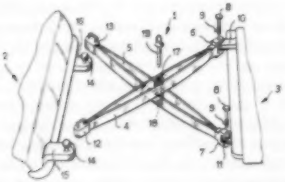
PCT No. PCT/FR80/00001, § 371 Date Aug. 28, 1980, § 102(e) Date Aug. 28, 1980, PCT Pub. No. WO80/01372, PCT Pub. Date Jul. 10, 1980

PCT Filed Jan. 2, 1980, Ser. No. 214,052

Claims priority, application France, Jan. 3, 1979, 79 00077; Jan. 2, 1980, 80 00001

Int. Cl.³ B60D *1/14*

U.S. Cl. 280—458 **2 Claims**



1. A trailer having wheels and a coupling device comprising two crossed arms each including a first end articulated to the trailer and a second end adapted to be hooked to a towing vehicle, an orifice formed in each of said arms at the point where the arms cross when the towing vehicle and the trailer are aligned, a bolt removably engaged in these two orifices coaxially aligned to lock the crossed arms together in a symmetrical position with respect to the longitudinal middle plane of the trailer, pivots fixed to the trailer, the wheels of the trailer being rotatably mounted on said pivots about axes disposed rearwardly of the axes of the pivots so that the wheels of the trailer are oriented around said pivots to follow the path of the front wheels of the towing vehicle.

4,429,895

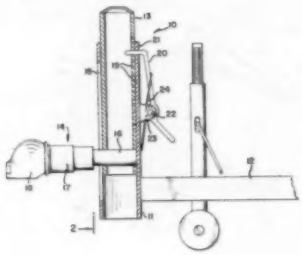
ADJUSTABLE TRAILER HITCH ASSEMBLY

Ronald W. Hunter, 7280 Nevada La., Colorado Springs, Colo. 80908

Filed Oct. 19, 1981, Ser. No. 312,861

Int. Cl.³ B60D *1/06*

U.S. Cl. 280—490 R **1 Claim**



1. An adjustable trailer hitch assembly, comprising, in combination, a cross-sectionally square sleeve secured fixedly in vertical position on a forward end of a trailer tongue, a correspondingly cross-sectional square tubing adjustably slidable vertically in said sleeve, said tubing carrying a forwardly extending ball hitch arm, for attachment to a towing vehicle, said arm extending through a vertical slot of said sleeve, and means for elevating said ball hitch arm in height for selectively tilting or leveling a towed trailer, said means comprising a coarse adjustment and a fine adjustment, said coarse adjustment comprising a latch bolt supported on said sleeve engaging a selected one of a vertical row of holes on said tubing, and said fine adjustment comprising a threaded opening through a bottom plate affixed to a lower end of said tubing, and an upwardly extending screw for adjustable engagement in said threaded opening, said screw being secured to said ball hitch arm, and being longer than a distance between an upper edge of said sleeve and an upper edge of said slot, so that said engagement is accomplished when said square tubing is slid upwardly outside said sleeve for rotation relative to said screw.

4,429,896

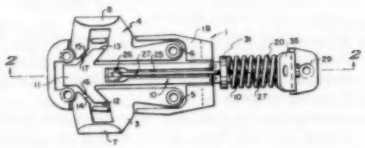
STEP-IN SKI BINDING

Richard G. Spademan, Box 6410, Incline Village, Nev. 89450

Continuation of Ser. No. 1,688, Jan. 8, 1981, abandoned. This application Sep. 1, 1981, Ser. No. 298,392

Int. Cl.³ A63C *9/10*

U.S. Cl. 280—624 **32 Claims**



1. In a step-in binding with a movable clamping member having an open position for disengaging a ski boot and a ski and a closed position for engaging a ski boot and a ski, an improvement comprising:

a step-in member; means mounting the step-in member for movement from a clamp-opened position to a clamp-closed position and from the clamp-closed position to a clamping force applied position, said step-in member functioning to be moved into the clamp-closed position

and then the clamping force applied position as the ski boot progressively displaces the step-in member;

a connecting member;

means coupling said step-in member and said connecting member;

a spring member;

means coupling said spring member and said connecting member; and

means coupling said spring member and said movable clamping member for closing said movable clamping member and thereafter causing said spring member to apply a clamping force to said movable clamping member as said step-in member is moved by said ski boot from said clamp-opened position through said clamp-closed position to said clamping force applied position, there being no substantial clamping force applied by the spring member to said clamping member when said step-in member is in said clamp-open position.

26. In a step-in binding with a movable clamping member having an open position for disengaging a ski boot and a ski and a closed position for engaging a ski boot and a ski, an improvement comprising: a step-in member; a connecting member; means coupling said step-in member and said connecting member; a spring member; means coupling said spring member and said connecting member; and means coupling said spring member and said movable clamping member for closing said movable clamping member and thereafter applying a clamping force to said movable clamping member as said step-in member is moved from a clamp-opened position through a clamp-closed position to a clamping force applied position, said means coupling said spring member and said clamping member comprising a movable linkage assembly movable between a clamp-opened position and a clamp-closed position for moving said movable clamping member to its clamp-closed position and thereafter applying said clamping force thereto as said movable linkage assembly is moved to its clamp-closed position, said means for coupling said connecting member to said step-in member and said spring member comprising means for moving said linkage assembly from its clamp-opened position to its clamp-closed position as said step-in member is moved from its clamp-opened position to its clamp-closed position.

4,429,897

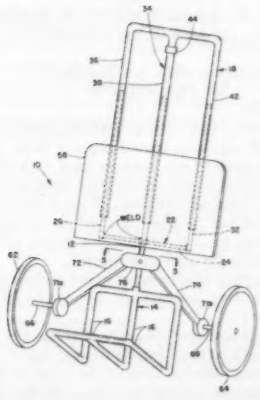
VARIABLE TERRAIN DOLLY

Donald M. Friedman, 8 Glenwood Dr., Hauppauge, N.Y. 11788, and Fred M. Monner, 21 Pimlico Dr., Commack, N.Y. 11725

Filed Feb. 5, 1982, Ser. No. 346,016

Int. Cl.³ B62B *1/12*

U.S. Cl. 280—646 **5 Claims**



1. A load carrying utility cart adapted for multi-terrain usage and for travel over a sandy or rocky surface, in particular, comprising:

a. a chassis comprising an elongated, tubular member with load supporting means mounted on the lower end thereof directed frontwardly and a frame of extensible tubular members mounted in a flat array on ssaid chassis for permitting an extension of the upper end thereof, said frame forming a back for said chassis to aid in the support of said load;

b. foldable shelf means mounted on said chassis adjacent the lower end of said frame, said shelf means directed frontwardly when unfolded and cooperating with said frame for support of said load;

c. pivot means located on said chassis for supporting a pair of wheels about which said chassis can be pivoted for permitting movement of said cart, said pivot means being located on said chassis at a point between said load supporting means and said shelf means, thereby permitting the balanced distribution of load about said pivot means;

d. said pivot means having arms extending rearwardly of said chassis from said pivot point, said arms being in a common plane which is at an angle with said chassis of no more than 45 degrees from the lower end of said chassis, and each of said arms directed sidewardly from said pivot means;

e. said wheels having a diameter which is in excess of one-half the distance between the lower end of said cart and the location of said pivot means, said wheels being supported at the free ends of said arms; and

f. handle means pivoted on one of said extensible frame adjacent the upper end of said chassis rotatable between a position folded in against said chassis and a position extending the height of said chassis for use in pulling said cart when in use, and including means to lock said handle means in any selected position.

4,429,898

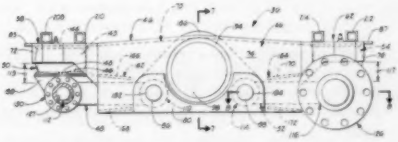
SUSPENSION ASSEMBLY FOR SEISMIC EXPLORATION VEHICLE

John W. Bedenbender, Piano, Tex.; Marvin C. Cook, and Otis A. Johnston, both of Ponca City, Okla., assignors to Mertz, Inc., Ponca City, Okla.

Filed Mar. 10, 1981, Ser. No. 242,358

Int. Cl.³ B60G *11/28*

U.S. Cl. 280—678 **16 Claims**



1. In a tracked vehicle having a substantially rigid main frame supported and moved by track assemblies disposed along opposing sides of the frame, each of the track assemblies including an endless track, at least one drive sprocket and a plurality of bogies disposed on the inside perimeter of the track to maintain the track in proper alignment and to support the vehicle, the improvement being a suspension assembly for connecting the bogies to the frame which comprises:

a walking beam having a forward end portion, a medial portion, and a rearward end portion, the medial portion of the walking beam pivotally connected to one side of the frame in a substantially parallel, spatial relationship with the side of the frame such that the walking beam is provided with a pivotation axis about a transverse axis of the main frame;

a forward bogie arm having one end and a distal end, said one end pivotally connected to the walking beam such that the forward bogie arm has a pivotation axis substantially parallel to the pivotation axis of the walking beam, said distal end having a bogie rotatably mounted thereon;

a first biasing means disposed between said distal end of the forward bogie arm and the walking beam for biasing the bogie thereon in a downwardly direction;

a rearward bogie arm having one end and a distal end, said one end pivotally connected to the walking beam such that the rearward bogie arm has a pivotation axis substantially parallel to the pivotation axis of the walking beam, said distal end having a bogie rotatably mounted thereon; and

a second biasing means disposed between said distal end of the rearward bogie arm and the walking beam for biasing the bogie thereon in a downward direction;

wherein each of the forward and rearward bogie arms comprises:

a first tubular member having a cylindrical shaped bore extending therethrough, the first tubular member forming said one end of each of the forward and rearward bogie arms; and

a second tubular member having a cylindrical shaped bore extending therethrough, the second tubular member forming the distal end of each of the forward and rearward bogie arms.

4,429,899

HOLLOW STABILIZER FOR VEHICLE

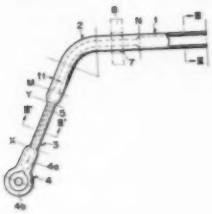
Akira Ohno; Toshiaki Sato, and Kanji Inoue, all of Yokohama, Japan, assignors to NHK Spring Co., Ltd., Yokohama, Japan

Continuation of Ser. No. 183,386, Sep. 2, 1980, abandoned. This application Nov. 22, 1982, Ser. No. 443,453

Claims priority, application Japan, Sep. 7, 1979, 54-123805

Int. Cl.³ B60G *19/00*

U.S. Cl. 280—689 **1 Claim**



1. A hollow stabilizer for a vehicle made from a single hollow pipe, said single hollow pipe comprising:

a hollow torsion section (1) coupled to the vehicle, said torsion section having a substantially circular cross-section;

hollow curved sections (2) integrally extending from the opposite ends of said hollow torsion section (1);

arm sections (3) integrally formed with, and extending from said curved sections (2) respectively, said arm sections (3) each having a cross-section substantially in the form of the letter I and which extends in a plane of action of the bending load applied to each said arm section; and

coupling sections (4) integrally formed with, and extending from, said respective arm sections (3), said coupling sections each having a substantially circular cross sectional portion (4*a*) connected to the end of the respective arm section (3) and a substantially flat shaped portion (4*b*) extending from said substantially circular coupling section portion (4*a*) and adapted to be coupled to a wheel suspension, each substantially flat shaped portion (4*b*) of said coupling sections extending in a plane substantially perpendicular to the plane of said I-shaped cross sectional portion of said arm section (3).

4,429,900

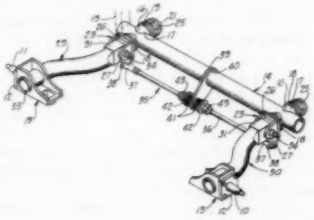
AUTOMOTIVE SUSPENSION SYSTEM FOR MAINTAINING THE REAR WHEELS SUBSTANTIALLY PARALLEL TO ONE ANOTHER THROUGHOUT USE

Joseph S. Feher, 900 N. Hammond St., #115, Los Angeles, Calif. 90069

Filed Nov. 6, 1980, Ser. No. 204,541

Int. Cl.³ B60G *3/14, 19/02*

U.S. Cl. 280—689 **7 Claims**



1. A rear wheel suspension system for an automotive vehicle, comprising:

first and second trailing arm means each having one end affixed to a rear wheel axle;

first and second clevis means movably connected with the respective other ends of the trailing arms enabling movement of the trailing arms thereabout in a substantially vertical plane;

first and second cylindrical members affixed respectively to the first and second clevis means;

an elongated beam having a pair of transverse openings therein spaced from each other along the beam, said openings rotatably receiving the respective cylindrical members therein;

a control link having its ends pivotally interconnected with the clevis means for transmitting rotation of one clevis means and associated cylindrical member to the other clevis means and associated cylindrical member; and

spring means carried by the control link for resiliently resisting movement thereof.

4,429,901

POSTING BOARD

Howard K. Clery, Jr., Brynmawr, and Scott R. Penniman, Lansdale, both of Pa., assignors to Rep Industries Inc., Lansdale, Pa.

Filed Jul. 6, 1981, Ser. No. 280,727

Int. Cl.³ B41L *3/00*

U.S. Cl. 282—29 B **6 Claims**

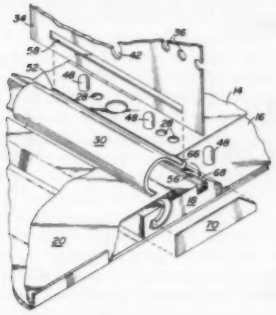
1. A check posting board having a writing surface provided with a column of regularly spaced aligning posts by which checks may be aligned over a business form with duplicating material therebetween by placing discrete holes in the checks and business form over selected ones of the posts, including:

(a) an elongated rail member adjacent to an edge of the writing surface, the longitudinal axis of said rail member being parallel to the column of posts;

(b) two spaced parallel slots in an upper surface of the rail member extending substantially the length of the rail member; and

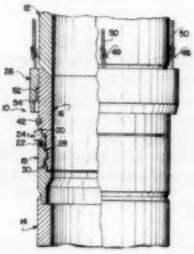
(c) a carriage for retaining checks by stub ends thereof in a manner in which a check may be aligned over the business form by placing selected ones of the holes in the check stub over selective ones of the posts, wherein the check carriage is an inverted U-shaped member and has a flange disposed in sliding engagement in each of said slots

whereby the carriage may be slid along the rail members and said flanges extend outwardly from the edges of the



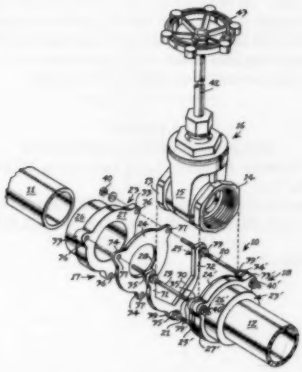
carriage, with the checks being retained by the inverted U-shaped member passing through a slot provided in the stub end of each check.

4,429,902
REMOTELY RELEASABLE CONNECTOR
William S. Cowan, West University Place, Tex., assignor to Armco Inc., Middletown, Ohio
Filed Sep. 18, 1980, Ser. No. 188,584
Int. Cl.³ F16L *37/08*
U.S. Cl. 285—3 **30 Claims**



1. A remotely releasable connector for first and second pipes, the combination comprising:
- first and second sets of engageable threads coupled to the first and second pipes;
- a first recess in the exterior of the first pipe;
- a second recess in the exterior of the second pipe, said recesses being substantially aligned when the pipes are threadedly engaged;
- a latch;
- means for supporting said latch in a locking position so that a first part is located in said first recess, and a second part is located in said second recess, thereby preventing disengagement of the pair of pipes; and
- release ring means, supported around the exterior of said pipes, for moving said latch out of the locking position by contacting said latch upon movement of said release ring means longitudinally of said pipes,
- the smallest interior diameter of said ring means that contacts said latch being slightly larger than the largest exterior diameter of at least one of said pipes adjacent said latch,
- said ring means being freely slidable along at least one of the pipes to at least the latch contacting position solely under the influence of gravity.

4,429,903
PIPE COUPLING DEVICE FOR RECEIVING REMOVABLY INSERTABLE VALVE
Marvin E. Baker, 815 Ewing Ave., Nashville, Tenn. 37203
Filed Jul. 29, 1981, Ser. No. 287,764
Int. Cl.³ F16L *35/00*
U.S. Cl. 285—24 **5 Claims**



1. A coupling device for connecting a coupling element having opposite end portions with aligned end openings, between opposed ends of coaxially spaced first and second pipe sections, comprising:
- (a) a first end flange member connectable to a first pipe section having a longitudinal axis, said first end flange member having a central opening therethrough coaxial with the first pipe section,
- (b) a first annular gasket having an outer surface adapted to fit flush in sealing engagement against said first end flange member, and an inner surface, and having a central opening therethrough coaxial with the central opening of said first end flange member,
- (c) a first guide member adapted to fit against said inner surface of said first annular gasket, said first guide member being generally U-shaped having a transversely extending bottom ledge and a pair of upright arms projecting upward from said bottom ledge and transversely spaced apart for receiving an end portion of a coupling element so that the corresponding end opening of the coupling element is coaxial with the central opening of said first end flange member,
- (d) a second end flange member connectable to a second pipe section having a longitudinal axis, said second end flange member having a central opening therethrough coaxial with the second pipe section,
- (e) a second annular gasket having an outer surface adapted to fit flush in sealing engagement against said second end flange member, and an inner surface, and having a central opening therethrough coaxial with the central opening of said second end flange member,
- (f) a second guide member adapted to fit against said inner surface of said second annular gasket, said second guide member being generally U-shaped having a transversely extending bottom ledge and a pair of upright arms projecting upward from said bottom ledge and transversely spaced apart for receiving the other opposite end portion of a coupling element so that the corresponding end opening of the coupling element is coaxial with the central opening of said second end flange member,
- (g) a plurality of elongated tie rods,

(h) means mounting said end flange members, said gaskets and said guide members on said tie rods for longitudinal axial movement, said end flange members being outermost and said guide members being innermost,

(i) said end flange members, gaskets, and guide members being axially adjustable on said tie rods to receive the opposite end portions of the coupling element in the respective first and second guide members, seated upon the respective ledges, located between the opposed arms, and sealed between said gaskets in operative position, and

(j) a pair of end securing elements on each end of each tie rod adjustably movable axially of said tie rods for urging said end flanges toward each other thereby compressing said gaskets into sealing engagement with said end flanges and the opposing ends of the coupling element and for locating said guide members in the desired position.

4,429,904

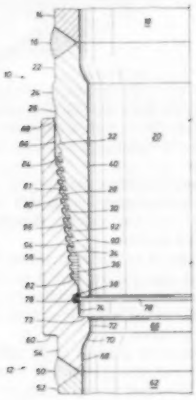
SELF-ALIGNING CONNECTOR

Larry E. Reimert, Houston, Tex., assignor to Dril-Quip, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 280,302, Jul. 6, 1981. This application Apr. 29, 1982, Ser. No. 373,114

Int. Cl.³ F16L *55/00, 25/00*

U.S. Cl. 285—24 **30 Claims**



1. A connector assembly comprising:

a. a first connector member including a first guide section and a second guide section axially displaced from, and of generally lesser external lateral dimension than, said first guide section;

b. a second connector member for receiving said first connector member, including a first receptacle, for receiving said first guide section, and a second receptacle, for receiving said second guide section, axially displaced from and of generally lesser internal lateral dimension than said first receptacle;

c. tapered external thread means, as part of said first member, positioned generally axially between said first and second guide sections;

d. tapered internal thread means, as part of said second member, positioned generally axially between said first and second receptacles and generally complementary to said first thread means for threaded engagement therewith; and

e. wherein said first and second guide sections may be partially received by said first and second receptacles, respectively, to align said first and second members without threaded engagement between said first and second thread means.

4,429,905

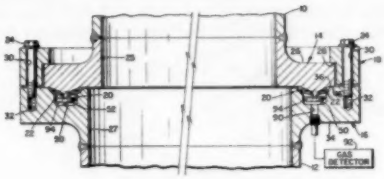
DUAL OPPOSED SEAL RING COUPLING

Gordon A. Valentine, Denver, Colo., assignor to Stanley Aviation Corporation, Denver, Colo.

Filed Dec. 29, 1981, Ser. No. 335,362

Int. Cl.³ F16L *35/00, 19/08, 23/00*

U.S. Cl. 285—93 **11 Claims**



1. In a coupling assembly, first and second tubular fluid passage-defining structures, means for relatively drawing said structures axially together to assemble said structures in coupled relation to each other, said structures defining therebetween first and second cavities each extending circumferentially around the longitudinal axes of said structures, first and second seal rings each received in a separate one of said cavities and each being torsionally deflectable about its cross section to a condition in which it establishes a substantially fluid tight seal between said structures, and coacting means on said first and second structures for engaging said seal rings and torsionally deflecting said seal rings about their cross sections as said structures are drawn axially together, said seal rings engaging said coacting means at locations where they impose non-cumulative radially directed forces on said structures upon being torsionally deflected to their sealestablishing conditions.

4,429,906

FEMALE ELEMENT FOR QUICK-COUPLING CONNECTION FOR FLEXIBLE PIPES

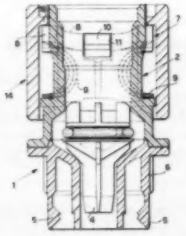
Oliviano Spadotto, Pordenone; Gianfranco Roman, Pasiano, and Claudio Da Rold, Pordenone, all of Italy, assignors to Claber S.p.A., Fiume Veneto, Italy

Filed Jul. 22, 1981, Ser. No. 285,324

Claims priority, application Italy, Jul. 31, 1980, 23847 A/80

Int. Cl.³ F16L *37/08*

U.S. Cl. 285—315 **2 Claims**



1. A female coupling for a quick-coupling connection comprising: a stiff tubular body having a bore adapted to receive a male element having a recess thereon, said tubular body and having two windows therein at diametrically opposite locations; a retaining ring concentric with and surrounding said tubular body and means retaining said ring on said body, said ring being axially movable relative to said body; and, positioned in a space between said tubular body and said retaining ring, a single-piece connection element for selectively locking a male element in the bore of said tubular body and releasing

the male element from said bore, said connection element including first and second semi-circular connector portions each having two opposite ends each of which is adjacent an end of the other semi-circular portion, said semi-circular portions facing each other and together surrounding said tubular body so as to be coaxial with the axis of said tubular body, each connector portion including intermediate its ends at least one tooth which projects radially inward into a corresponding window in said tubular body for engagement with and disengagement from a recess in the male element of the connection, said connection element further including two resilient spring portions disposed axially adjacent said semi-circular connector portions for yieldably urging said teeth to protrude inside said tubular body, each said resilient spring portion being generally C-shaped and having opposite ends one of which is integral with one end of said first connector portion and the other of which is integral with the adjacent end of said second connector portion, each spring portion lying in a generally semi-circular plane so as to exhibit a convex surface and having an axis transverse to the axis of the two connector portions, said convex surfaces of the two spring portions facing toward each other, said tubular body having stop surfaces engaging said spring portions and limiting axial movement thereof and said retaining ring having surfaces engageable with said connector portions to press said connector portions toward said spring portions upon manual axial movement of said retainer ring whereby said teeth are moved radially outward against the bias of said spring portions.

4,429,907

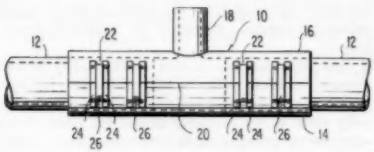
PIPE COUPLER

Fred A. Timmons, 418 Juniper Ave., Chico, Calif. 95926

Filed Aug. 10, 1982, Ser. No. 406,860

Int. Cl.³ F16L *17/04*

U.S. Cl. 285—373 **10 Claims**



1. A pipe coupler for forming a water-tight seal on an existing pipe comprising:

(a) first and second elongated complementary members of generally semi-cylindrical cross-section, said members having abutting edges and being arranged to enclose a leak or joint in the existing pipe;

(b) said first and second members including a plurality of spaced lugs projecting from the walls of said members and extending transversely of said abutting edges, the space between each pair of said lugs on said first and second members being aligned and providing a recess having opposing faces and said recess extending across said abutting edges;

(c) reinforcing elements received in each of said recesses and extending across said abutting edges for reinforcing said coupler, each of said reinforcing elements having a constant thickness over its entire extent measured in the direction transverse to said faces and being approximately equal to the spacing between adjacent lugs and each of said reinforcing elements having tight engagement with the opposed faces of said spaced lugs; and

(d) means for holding said reinforcing elements in said recesses and for causing said abutting edges to adhere to each other.

4,429,908

LATCHING MECHANISM ON COKE OVEN DOORS

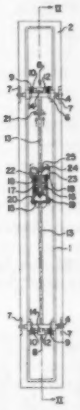
Friedrich Ernst, Dortmund, Fed. Rep. of Germany, assignor to C. Otto & Comp. G.m.b.H., Bochum, Fed. Rep. of Germany

Filed Oct. 13, 1981, Ser. No. 310,535

Claims priority, application Fed. Rep. of Germany, Nov. 28, 1980, 8031715[U]

Int. Cl.³ E05C *9/16*; C10B *25/04*

U.S. Cl. 292—35 **7 Claims**



1. A mechanism for latching to a coke-oven door frame a coke-oven door, said mechanism comprising:

first and second latching beams mounted on said door for movement toward and away from said door, said latching beams being at different heights with respect to said door,

hooks so mounted upon said door frame as to be in abutting relationship with outer ends of said first and second latching beams when said latching mechanism is in a closed position,

means secured to said door for guiding each of said latching beams for movement in a plane perpendicular to that of said door,

first and second toggle mechanisms operatively associated with, respectively, said first and second latching beams, each of said toggle mechanisms comprising a pivot and a pair of toggle arms having portions distal with respect to said pivot which are in operative association with said latching beams,

a common biasing element, and

actuating rods connecting said common biasing element and said pivots of said toggle mechanisms.

4,429,909

RESTRAINT ASSEMBLY FOR DOOR EXIT DEVICES

John L. Lindquist, 2109 Scarborough Dr., Lodi, Calif. 95240

Continuation-in-part of Ser. No. 329,729, Dec. 11, 1981, abandoned. This application Jul. 6, 1982, Ser. No. 395,172

Int. Cl.³ E05C *15/02*

U.S. Cl. 292—92 **24 Claims**

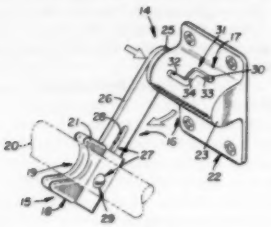
1. A restraint assembly for a door exit device having a pivotal panic bar depressable from a raised position to unlatch a door, said restraint assembly comprising

a pivotal member movable between an engaged position beneath said panic bar to hold it in its raised position, and a disengaged position to permit pivotal depression of said panic bar,

mounting means for mounting said member on said door for pivotal movement between its engaged and disengaged positions, and

preload means for imposing a predetermined preload on said

member to hold it in its engaged position beneath said panic bar and to permit pivotal depression of said panic



bar and said member when a predetermined opening force is imposed on said panic bar.

4,429,910

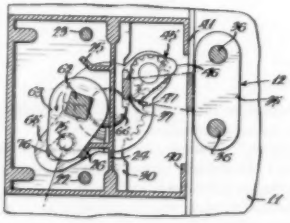
WINDOW LOCK

Donald L. Anderson, Owatonna, Minn., assignor to Truth Incorporated, Owatonna, Minn.

Filed Oct. 8, 1981, Ser. No. 309,562

Int. Cl.³ E05C 3/06

U.S. Cl. 292—199 **7 Claims**



3. A window lock comprising a keeper, a casing having an opening to receive the keeper and a rotatable handle for moving a cam within the casing into locked relation with the keeper, an actuator member mounted within the casing for pivotal movement about a pivot axis between two lock positions at opposite sides of a center position, said cam being mounted on said actuator member for rotation about a second axis at a distance from said pivot axis, means for causing rotation of the cam as the cam moves with the actuator member during pivoting of the actuator member, said cam having a generally triangular shape with a pair of locking sections with a pair of lock surfaces angularly diverging from each other and at generally equal angles to a line normal to the casing opening when the actuator member is in the center position, said locking sections being alternately operable one at each of said lock positions with the bodily movement of the cam moving one of the locking sections behind the keeper at the center position of the actuator member and continued movement of the actuator member causing the last-mentioned locking section to move in a direction to force the keeper into the casing as a combination of cam rotation and bodily movement, and connection means between said handle and the actuator member.

4,429,911

SECURITY DOOR BAR SYSTEM

William C. O'Neal, 4903 E. Crestwood, Little Rock, Ark. 72209, and James L. Grasby, 659 Cloverdale Rd., Jacksonville, Ark. 72076

Filed Mar. 1, 1982, Ser. No. 353,574

Int. Cl.³ E05C 19/18, 17/06

U.S. Cl. 292—259 R **1 Claim**

1. A security bar system for preventing undesired forcible opening of a hinge mounted door, the system adapted to be employed in conjunction with either left opening or right opening doors and comprising:

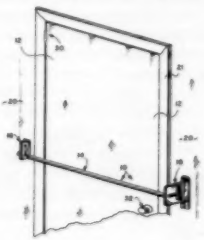
a first, rigid bracket adapted to be securely mounted adjacent the hinge side of said door; said first bracket provided with a central orifice and a generally vertically oriented slot symmetrical about said orifice;

a rigid displacement bracket adapted to be rigidly mounted adjacent the opposite side of said door, said displacement bracket comprising:

a generally planar mounting portion adapted to be rigidly secured to a wall adjacent said door; and,

a cooperating, generally planar offset rigid member hingeably coupled to said mounting portion, said cooperating portion provided with a generally T-shaped, symmetrical slot including a vertically oriented slot portion and a horizontally oriented slot portion perpendicularly bisecting and communicating with said vertically oriented slot portion;

an elongated, symmetrical, reversible, rigid, generally cylindrical bar adapted to extend between said first rigid bracket and said displacement bracket and to be removeably coupled thereto whereby to secure said door, said bar terminating at each of its ends in integral, circular flange



members separated from the major length of said bar by reduced diameter segments of predetermined, equal length;

said first rigid bracket central orifice being of sufficient diameter to admit either of said bar flanges, and the major length of said first slot bracket being of a width substantially equal to the diameter of said bar reduced diameter segments to prevent axial displacement of a bar flange while permitting clearance of the door bar reduced diameter segment; and,

the intersection of said vertically oriented slot portion of said displacement bracket member with said horizontally oriented slot portion permitting axial admission of an opposite one of said bar end flanges, but the width of said horizontal and vertical slot portions being substantially equal to the diameter of said bar reduced diameter segments whereby to prevent axial withdrawal of said door bar flange while permitting clearance of a door bar reduced diameter segment, the generally horizontally oriented portion of said slot permitting limited opening of said door as a portion of a reduced diameter segment of said door bar may track therewithin during limited opening of said door.

4,429,912

FOLDABLE SECURITY BAR

Robert P. Smith, Jr., Irving, Tex., assignor to Michael Clate Woodlock, Ft. Worth, Tex.

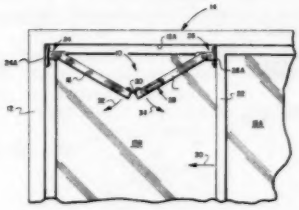
Filed Jul. 6, 1981, Ser. No. 280,499

Int. Cl.³ E05C 17/12

U.S. Cl. 292—263 **1 Claim**

1. In a slidable panel assembly in which a panel is movable along parallel channel members between open and closed positions within a support frame and in which the movable panel can be removed from the assembly by transverse dis-

placement of the panel out of engagement with one channel member, the improvement comprising a foldable security bar assembly for securing the movable panel against said support frame, said foldable security bar assembly including first and second bars each having a tubular open end portion; a hinge pivotally connecting said first bar to said second bar whereby said first and second bars are rotatable about a common axis from a closed panel position, in which their tubular open end portions are in axial alignment, to an open panel position in which said bars extend transversely with respect to each other; a latch slidably received within the tubular open end portion of the first bar and movable from a released position in which said latch is fully retracted within the open end portion of said first bar thereby permitting unobstructed pivotal movement of said



first bar and said second bar relative to each other, and movable to a locked position in which opposite end portions of said latch extend within both tubular open end portions of said first and second bars when said tubular open end portions are in axial alignment, thereby preventing pivotal movement of said first bar and said second bar; and, bracket means pivotally coupled to said first and second bars and mounting said first and second bars to the movable panel and support frame, respectively, said bracket means including a mounting plate attached to said movable panel in a position closely adjacent said support frame but spaced from said frame allowing sliding movement of said panel along said channel members without interference, but engaging said support frame and thereby serving as a stop member in response to transverse displacement of the movable panel within said channel members.

4,429,913

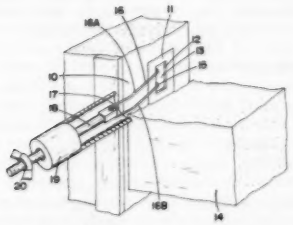
SLEEVE TYPE DOOR SECURING DEVICE

Henry A. Bey, Breckenridge, Minn., assignor to Lena Bey, Wahpeton, N. Dak.

Filed Feb. 17, 1981, Ser. No. 234,770

Int. Cl.³ E05C *19/18*

U.S. Cl. 292—293 **3 Claims**



1. For use with a door which is hingedly mounted in an opening which has a door jamb, an opening in the door jamb for receiving a latch and a striker plate around the opening, there being a space between the side edge of the door and the door jamb even when the door is swung fully closed, a portable device for securing the door when closed comprising:

(a) a pair of tensilely strong parallel spaced-apart piano wire members joined together at one end and having hooking means at the other end for engaging an inner edge of the opening in the striker plate on the door jamb said members extending partway from said other end along the door jamb in a direction which the door normally swings open and then partway angled inward to said one end, the wire members being thin enough to permit the door to close even when the hooking means is engaging the edge of the striker plate opening;

(b) an elongated threaded member pivotally attached at one end to the one end of said wire members whereby the threaded member can be swung away from the door opening to permit the door to be swung open or closed when the hooking means on the wire member is engaging the edge of the striker plate opening;

(c) a sleeve over said threaded member, the outer diameter of the sleeve being substantially larger than the space between the door and the door jamb when the door is closed and the axial opening in the sleeve being larger than the diameter of said threaded member to permit the sleeve to slide over the threaded member; and

(d) a wing nut threadably engaging the threaded member for moving the sleeve along said threaded member to securely hold the sleeve against the edge of the door and the door jamb when the door is closed.

4,429,914

SUPPORT SYSTEM FOR THE BODY OF A MOTOR VEHICLE, ESPECIALLY A PASSENGER CAR

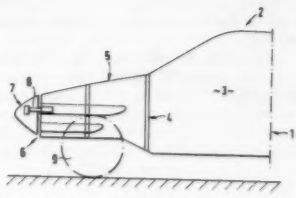
Ulrich Bez, Gerlingen; Gerhard Schroder, Ditzingen, and Michael Rauser, Kornwestheim, all of Fed. Rep. of Germany, assignors to Dr. Ing.h.c.F.Porsche AG, Fed. Rep. of Germany

Filed Sep. 30, 1981, Ser. No. 307,317

Claims priority, application Fed. Rep. of Germany, Oct. 15, 1980, 3038920

Int. Cl.³ B62D *21/00*

U.S. Cl. 296—188 **16 Claims**

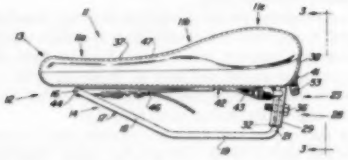


1. A support structure constructed as at least part of a fender for the body of a motor vehicle and adapted to absorb forces by deformation, the support structure extending between one of the walls of a passenger compartment and one end part of the vehicle and providing for the connection of chassis elements, said support structure comprising support means including a forward section and a rear section interconnected intermediate said one wall of the passenger compartment and said one end part of the vehicle, said forward section and said rear section each including inner wall means and outer wall means cooperating to form at least one frame-like member and said at least part of a fender, said support means adapted for supporting said passenger compartment relative to said chassis elements, and for deforming to absorb the energy of forces greater than a predetermined amount, said forward section adapted to be less resistant to deformation than said rear section.

4,429,915
BICYCLE SEAT

Calvin D. Flager, 23102 64th Ave. W., Mountlake Terrace, Wash. 98043

Filed Mar. 13, 1981, Ser. No. 243,314
Int. Cl.³ B62J 1/26
U.S. Cl. 297—199 10 Claims

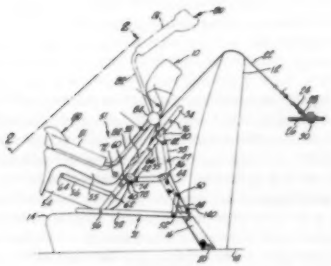


1. A bicycle seat comprising:
support means;
seating means mounted on said support means and including pommel means, rear means for bearing weight, and intermediate means forming a slope and connecting said pommel means and said rear means;
tube means of variable pressurization is disposed throughout said pommel means, rear means and intermediate means, and foam means is disposed in said rear means and extends into said intermediate means to form said slope, said tube means extending around said foam means, said tube and foam means being adjustable to provide support areas of contrasting hardness; and
said rear means bearing weight of the rider transmitted through the rider's ischial tuberosities, said intermediate means bearing against the rider's pubic symphysis at said slope, said rear means and said intermediate means cooperating to urge proper low back curvature of the rider forward over said pommel means.

4,429,916
INFANT CAR SEAT

Richard E. Hyde, Palos Verdes; Gary L. Smith, Los Angeles; Lee T. Carmichael, Pasadena, and Albert E. Meader, Palos Verdes, all of Calif., assignors to California Strolee, Inc., Compton, Calif.

Filed Feb. 23, 1981, Ser. No. 237,491
Int. Cl.³ B60R 21/10
U.S. Cl. 297—250 14 Claims

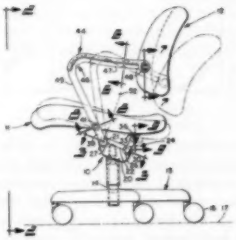


1. An infant car seat for use in protecting and restraining a child, comprising in combination:
a substantially rigid body member contoured to form head, back and seat portions;
a support frame secured to said body member and adapted to rest said body member on an automobile seat;
a means for securing said support frame to said automobile seat;
an internal harness system attached to said body member and adapted to fit about a child;
a rotatable arm rest/shield secured to said body member;
a biasing means cooperatively connected to said body member and said arm rest/shield for biasing said arm rest/shield to a raised position;
a means cooperative with said internal harness system and said arm rest/shield for maintaining said biased arm rest/shield in a lowered position in front of said child.

4,429,917
CHAIR

Niels Diffrient, Ridgefield, Conn., assignor to Hauserman Inc. Int. Furniture & Textile Division, Norwalk, Conn.

Filed Apr. 29, 1981, Ser. No. 258,760
Int. Cl.³ A47C 3/00
U.S. Cl. 297—300 16 Claims

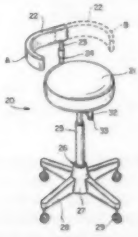


1. A chair comprising a seat, a back, a four bar linkage, said linkage including a base, said seat forming a second link of said linkage, said linkage including a third link having one end portion pivotably connected with a rear portion of said base and an opposite end portion pivotably connected with a rear portion of said seat, a fourth link having a first end portion pivotably connected with a forward portion of said base and a second end portion pivotably connected with a forward portion of said seat, and means for mounting and fixing said back to said fourth link for pivoting movement together with said fourth link about said pivotable connection between said fourth link and said base.

4,429,918
OPERATORY STOOL

James D. Alsup, Jr., Bay Minette, Ala.; Kenneth L. Barrett, Des Moines, Iowa, and Arden F. Jenkins, Bay Minette, Ala., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Continuation of Ser. No. 171,637, Jul. 24, 1980. This application Nov. 12, 1982, Ser. No. 440,914
Int. Cl.³ A47C 1/00
U.S. Cl. 297—353 43 Claims



1. A stool comprising:
a seat;

means depending from the seat from engaging a support surface;

an arcuate, body support arm positioned above the level of said seat for supporting a portion of the body of a user, said support arm having a concave surface;

support means supporting said body support arm above the level of said seat, and

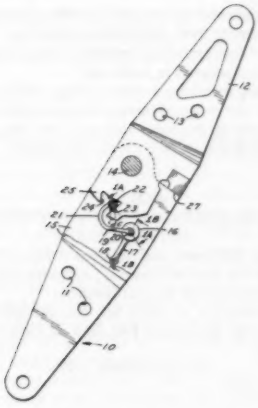
connecting means for rotatably attaching said end of said support arm to a top end of said connecting means, said body support arm being reversibly rotatably secured about its point of attachment to said connecting means on either side thereof in a substantially horizontal position.

4,429,919

COMPOSITE INERTIA LATCH FOR VEHICLE SEAT BACK

Bernd A. Klueting, Radevormwald, Fed. Rep. of Germany, and Vikram Zaveri, Springfield, Mich., assignors to Keiper Recaro, Inc., Battle Creek, Mich.

Filed Mar. 9, 1981, Ser. No. 241,734
Int. Cl.³ B60N 1/02
U.S. Cl. 297—379 **8 Claims**



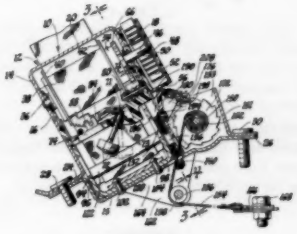
1. Gravity/inertia actuated latch for hinged vehicle seat back rest comprising pivotally connected hinge members mountable respectively on vehicle seat and back rest components, interengaging fixed and gravity/inertia actuated latch means mounted on said hinge members operative upon sudden vehicle deceleration to arrest back rest forward tilting, means responsive to operative back rest position to maintain said latch means oriented for interengagement, gravity/inertia actuated latch biasing means effective upon initial forward seat back tilting to release said latch means when said vehicle is stationary and to maintain said latch means in interengaging orientation upon initial forward seat back tilting under emergency vehicle deceleration conditions, and characterized by a composite latch construction including a gravity/inertia responsive mass element and separate latch engaging element, interconnecting means between said elements effective when the vehicle is stationary to move said latch engaging element of said latch means to a latch release position upon initial forward seat back tilting, and means responsive to vehicle deceleration for reducing the effective latch disengaging bias of said mass element and thereby also reduce the inertia value required to overcome said gravity bias and prevent latch disengagement under vehicle deceleration, said latch means including pivoted toggle linkage means connecting said latch engaging and mass elements adapted to neutralize said gravity unlatching bias in response to inertia imposed by vehicle deceleration.

4,429,920

LOAD TRANSFER SYSTEM FOR SEAT MOUNTED RETRACTOR

Joseph D. Kondziola, Troy, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Sep. 4, 1981, Ser. No. 299,407
Int. Cl.³ B60R 21/00
U.S. Cl. 297—478 **3 Claims**



1. A seat belt retractor for winding and unwinding an occupant restraint belt and adapted for mounting on a vehicle seat mounted on a vehicle body, said retractor comprising:

a housing;

a belt reel rotatably mounted on the housing for restraint belt winding and unwinding rotation;

reel locking means for selectively locking the reel against restraint belt unwinding rotation so that a load is imposed on the restraint belt during restraint of an occupant;

belt clamping means movably mounted on the housing adjacent the exit of the restraint belt from the reel and being movable relative the housing and reel in response to imposition of occupant restraint load on the belt to clamp the restraint belt against extension from the retractor;

an anchor belt reel rotatably mounted on the housing for winding and unwinding an anchor belt having an end adapted for mounting on the vehicle body rearward of the seat;

a lock bar engageable with the anchor belt reel to lock the reel and thereby fix the length of the anchor belt to anchor the retractor housing and seat against forward movement by the occupant restraint load imposed on the restraint belt; and

means acting between the belt clamping means and the lock bar and adapted to engage the lock bar with the anchor belt reel upon restraint belt clamping movement of the restraint belt clamping means relative the housing and reel in response to imposition of occupant restraint load.

4,429,921

SLIDING BEARING AND SEAL

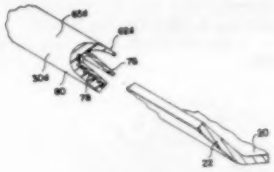
William E. Fritz, Naperville, and Thomas C. Soddy, Downers Grove, both of Ill., assignors to The Youngstown Steel Door Company, Cleveland, Ohio

Division of Ser. No. 90,301, Nov. 1, 1979, Pat. No. 4,344,365. This application Jan. 25, 1982, Ser. No. 342,596
Int. Cl.³ B61D 7/22, 7/26; F16C 17/26
U.S. Cl. 308—3.5 **4 Claims**

1. An elongated low-friction body comprising an elongated channel defining steel strip having a metal matrix welded thereto, said matrix including a polymeric low-friction material molded thereto defining an elongated guide surface opposite said channel and an elongated load bearing surface between said channel and said guide surface, one side of said channel being defined by a flange extending along the length of said body with said molded polymeric material further defining an elongate integral tapered projecting sealing flap extending at least partly over said flange in outwardly-spaced relationship thereto along the length of said body.

2. An elongated body of low-friction polymeric material, a

substantially flat surface extending along the length of said body, a flange extending along the length of said body in spaced-apart relationship to said flat surface to define a mounting channel therebetween, a plurality of studs extending outwardly from said flat surface toward said flange and being spaced-apart from one another along the length of said body, and means for attaching said studs to said flange.



4,429,922

ANTIFRICTION AXIAL GUIDE MEANS

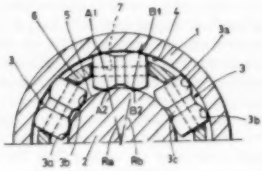
Walter Pfluger, Solothurn, Switzerland, assignor to Agathon A.G. Maschinenfabrik, Solothurn, Switzerland

Filed Jul. 15, 1981, Ser. No. 283,647

Claims priority, application Switzerland, Jul. 17, 1980, 5492/80

Int. Cl.³ F16C *29/04*

U.S. Cl. 308—6 R **1 Claim**



1. An assembly adapted for relative linear movement comprising a guiding part and a guided part movable only linearly relative to one another, said guiding part having at least one first race disposed thereon and said guided part having at least one second race disposed thereon, a plurality of roller-shaped elements each defining an axis of roll in a plane perpendicular to the direction of relative linear movement between said guiding and guided parts, and disposed between said guiding and guided parts, each of said roller-shaped elements comprising two spaced, spherical-segment-shaped bearing surfaces of equal diameter with their centers spaced from one another along said axis of roll and rigidly connected to one another, said two bearing surfaces respectively contacting said first and said second races at substantially a single point each for ensuring substantially identical rolling conditions of both said bearing surfaces relative to both said first and second races as said guided and guiding parts move in a linear direction relative to one another.

4,429,923

BEARING SUPPORT STRUCTURE

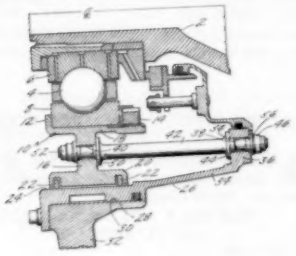
Richard T. White, West Hartford, and Louis Kudlacik, Glastonbury, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 8, 1981, Ser. No. 328,568

Int. Cl.³ F16C *27/00*

U.S. Cl. 308—184 R **1 Claim**

1. In a bearing support construction:
a fixed supporting structure;
a shaft positioned within said structure;
a bearing for the shaft having an outer race;
a supporting ring for said outer race;
an oil damping structure surrounding said ring and including an annular member having an inner cylindrical surface and having a mounting flange thereon;
said supporting ring having an outer cylindrical surface located adjacent to and spaced radially inward of said inner cylindrical surface to define therebetween an oil damping space;



said annular member having an inwardly extending flange at the end remote from the cylindrical surface;
a plurality of rods extending from said flange to said supporting ring and secured in both; and
the supporting ring being I-beam in shape with a disk portion to receive the rods and having integral cylindrical flanges one supporting the outer race and the other having the outer cylindrical surface for the oil damper.

4,429,924

PRESSURE-LUBRICATED AUTOMOTIVE-TYPE ALTERNATOR

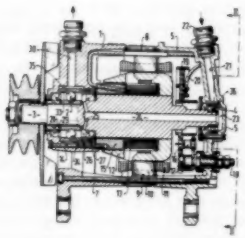
Herbert Franz, Stuttgart, and Manfred Frister, Schwieberdingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jul. 29, 1982, Ser. No. 403,099

Claims priority, application Fed. Rep. of Germany, Sep. 10, 1981, 3135901

Int. Cl.³ F01M *1/06*

U.S. Cl. 308—187 **8 Claims**



1. Pressure-lubricated vehicular-type alternator comprising
a stator;
a rotor;
a drive side bearing (2) and a rear side bearing (4);
a shaft rotatable in said bearings and supporting the rotor;
and a pressure lubricating circuit to lubricate said bearings, comprising
an oil pressure supply duct (21) and an oil removal duct (30);
a longitudinal bore (24) formed in the shaft (3);
at least one axially inclined radially extending communication bore (25) formed in the shaft adjacent said drive side bearing (2) and located to fling oil by centrifugal force out of said longitudinal bore, said shaft terminating in an

orifice directing said so-flung oil towards and across an end face of said drive side bearing;

means (23) for establishing fluid communication between the oil pressure supply and the longitudinal bore (24) in the shaft;

and means for removing oil from said drive side bearing and establishing oil communication between said drive side bearing and the oil removal duct (30).

4,429,925

BALL BEARING METHOD FOR ASSEMBLING THE BEARING AND AN APPARATUS FOR GRINDING THE BEARING

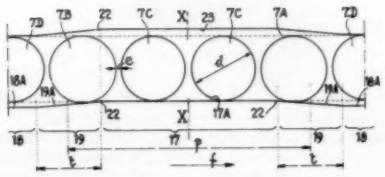
Michel A. Orain, Conflans Sainte Honorine, France, assignor to Glaenzer Spicer, Poissy, France

Filed Mar. 23, 1982, Ser. No. 361,068

Claims priority, application France, Mar. 25, 1981, 81 05976

Int. Cl.³ F16C *13/00, 33/58;* **B24B** *1/00, 5/00*

U.S. Cl. 308—189 R **13 Claims**



1. In a ball bearing having an axis of rotation and comprising two bearing rings defining ball tracks, and a single row of balls interposed between the tracks, said tracks each having a cross-sectional concave, curvilinear contour which envelopes each ball sufficiently to ensure contact between the ball and the track in bearing operation, each track contour having a side portion on each side of the ball which is flatter than the curvature of the ball surface; the improvement wherein one of said rings is a fixed ring for subjection to a moment of given direction perpendicular to said axis of rotation, the track of the fixed ring being ground in such manner as to provide at least one unloaded region of the tracks on each side of a diameter perpendicular to said moment and, at each end of said diameter, a loaded ball region which creates, upon assembly of the bearing, a pre-stressing of the balls in said two loaded ball regions, which pre-stressing has an axial component in a direction opposed to the direction of said moment, said unloaded regions being interposed between two regions for respectively progressively loading and progressively unloading the balls, the fixed ring being adapted to receive a ball in one of said unloaded regions at least without a pre-stressing of the ball upon assembly of the bearing and in normal operation of the bearing.

12. An apparatus for grinding a ball bearing comprising two bearing rings defining ball tracks and a single row of balls interposed between the tracks and assembled with pre-stressing of the balls, wherein, in a localized sector of the periphery of the bearing comprising a completely unloaded ball region adjoining two regions for progressively loading and unloading the balls, the tracks of the bearing rings are ground in such manner as to be capable of receiving, in the completely unloaded region, a ball at least without a pre-stressing of the ball upon assembly of the bearing and in normal operation of the bearing, a fixed ring of said rings being provided for subjection to a moment of a given direction perpendicular to the axis of rotation of the bearing and said bearing comprising, in a free state of the bearing, at least one unloaded region on each side of a diameter perpendicular to said moment and, at each end of said diameter, a loaded region which creates, upon assembly of the bearing, a pre-stressing comprising an axial component in a direction opposed to the direction of said moment, said apparatus comprising a grinding wheel, a rotary spindle driven by a motor, a workpiece carrying rotary table perpendicular to the axis of rotation of the spindle, elastically yieldable connecting means connecting the table to the spindle, means for biasing the table in a variable manner in the course of the rotation of the table, at least in a direction parallel to the axis of rotation of the table, and means for maintaining a rolling bearing ring coaxially with the table, the elastically yieldable connecting means being capable of rotating the ring about a fixed axis passing roughly through the centre of the rolling bearing ring under the effect of said biasing means.

4,429,926

THIN-WALLED BEARING BUSHINGS MANUFACTURED BY A DEEP DRAWING PROCESS

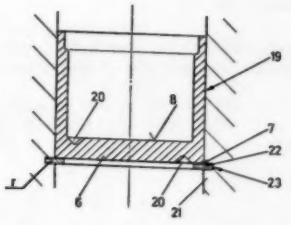
Armin Olschewski, Schweinfurt; Manfred Brandenstein, Eussenheim; Heinrich Kunkel, Schweinfurt; Hermann Hetterich, Heidenfeld; Peter Horling, Mainberg, and Lothar Walter, Schweinfurt, all of Fed. Rep. of Germany, assignors to SKF Kugellagerfabriken GmbH, Schweinfurt, Fed. Rep. of Germany

Filed Jul. 17, 1981, Ser. No. 284,190

Claims priority, application Fed. Rep. of Germany, Jul. 18, 1980, 3027262

Int. Cl.³ F16C *33/58, 33/64*

U.S. Cl. 308—216 **6 Claims**



1. Thin-walled bearing bushing produced in a drawing process for the support of pins in universal joints comprising an elongated generally cylindrical sleeve section and a bottom section forming an end closure at one axial end of said sleeve section, the juncture of the peripheral surface of said sleeve section and the outer axial end face of said bottom section defining an outer rim having at least portions of a cross-sectional radius (r) smaller than the cross-sectional (R) at the juncture of the inner peripheral surfaces of the sleeve section and the inner axial end face of the bottom section and means defining at least a pair of separate grooves in the bottom section circumferentially spaced from one another and being disposed adjacent said peripheral rim.

4,429,927

CASING HAVING A MOUNTING PORTION AT ITS INNER WALL SURFACE FOR RECEIVING A BEARING MEMBER THEREIN

Akira Kawabata, 2-24-7 Shimizu, Suginami-ku, Tokyo, Japan, assignor to Akira Kawabata and Sunny Co., Ltd., both of, Japan, a part interest

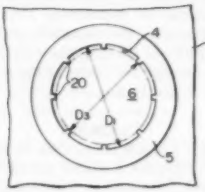
Filed Apr. 6, 1981, Ser. No. 251,453

Int. Cl.³ F16C *35/06*

U.S. Cl. 308—236 **4 Claims**

1. In a casing shaped from a light metal material by die-casting and having formed on its inner wall surface a mounting portion with a receiving end, a circular inner surface, and a bottom end, said mounting portion being adapted to receive a bearing member having a circular outer surface and serving to journal a shaft; the improvement comprising a plurality of supporting protrusions extending from the circular inner surface of the mounting portion into which the bearing member is to be press-fitted and spaced at predetermined intervals in the circumferential direction about the circular inner surface, the

circumferential width of each supporting protrusion increasing from the receiving end of the mounting portion to the bottom



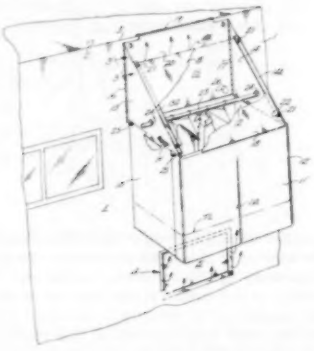
end of the mounting portion, the supporting protrusions having projecting ends defining a circle of substantially uniform diameter.

4,429,928

CLOTHES DRYING STRUCTURE

Ronald E. Sullivan, 9007 NE. 76th St., Vancouver, Wash. 98662

Filed Aug. 24, 1981, Ser. No. 295,737
Int. Cl.³ A47B *77/08;* A01F *25/12*
U.S. Cl. 312—31 **7 Claims**



1. A collapsible clothes drying structure for attachment to the exterior side of a mobile living unit having an exhaust vent in a wall of the unit, said structure comprising,

an enclosure defining a clothes drying area,

an enclosure support means for attachment to said living unit above the exhaust vent, said support means including a base for temporary rested abutment with the side of the mobile unit, side members, means movably mounting said side members on said base for collapsing movement of said side members about separate upright axes, a top wall in rested placement on said side members, and

hanger means supported by said side members for supporting wearing apparel within the drying area of the enclosure.

4,429,929

PORTABLE TUBE HOLDER

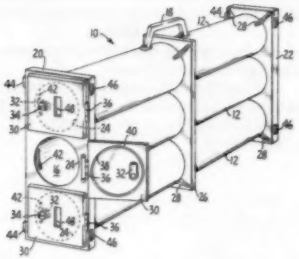
J. Fred Stepp, 1888 Meadow La., Walnut Creek, Calif. 94595

Filed Aug. 3, 1981, Ser. No. 289,479
Int. Cl.³ B65D *5/35*
U.S. Cl. 312—107 **5 Claims**

1. A portable tube holder comprising at least two elongated tubes, each of said tubes having two open ends, a surrounding wall, and a hollow interior;

a single front header permanently sealed to one end of each tube to fixedly hold said one end of each tube thereto in a spaced apart relationship, said front header being provided with a plurality of openings extending therethrough, said openings being equal in number to said tubes, and each of said openings being aligned with said hollow interior of one of said tubes to allow materials to be placed in and removed from said hollow interior of each tube;

a single, solid rear header permanently sealed to the other end of each tube to fixedly hold said other end of each tube thereto in a spaced apart relationship, and to form an end wall for each tube;



a carrying handle attached to one of said tubes to allow said portable holder to be lifted and transported; and

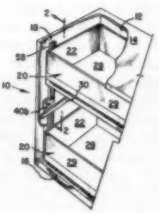
a plurality of moveable doors removeably mounted on said front header, with each door being in aligned relationship with one of said openings, and locking securing means held in each of said doors and cooperating with said aligned tube whereby each of said doors may be selectively locked in position covering said aligned opening.

4,429,930

INTERLOCK FOR DRAWERS

Joseph L. D. C. Blouin, Levis, Canada, assignor to Nightingale Saro Inc., Romuald, Canada

Filed Mar. 10, 1982, Ser. No. 356,808
Claims priority, application Canada, Dec. 24, 1981, 393236
Int. Cl.³ E05B *65/46;* E05C *15/04*
U.S. Cl. 312—216 **7 Claims**



1. A drawer interlock apparatus for a cabinet having multiple drawers comprising;

a plurality of slide bars mounted within such cabinet and movable between locking and releasing positions;

at least one drawer locking cam for each drawer, each such cam being pivotally mounted on a first pivot axis on a respective slide bar, and being movable between open and closed positions;

a recess in such locking cam;

drawer securing means on each said drawer interengageable with such recess in such cam, when in the closed position and being releasable from such recess in the open position to permit the drawer to be opened, and,

linkage means connected to said cam at a second pivot axis spaced from said first pivot axis, and said linkage means connecting to the slide bar of the next adjacent cam of a

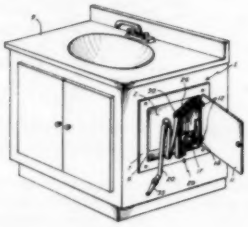
next adjacent drawer, such linkage means being responsive to opening movement of said first mentioned cam about said first pivot axis into its open position to move the slide bar to which such linkage is connected and thereby move the next adjacent cam to which such slide bar is connected and thereby prevent opening movement of the second mentioned cam.

4,429,931

CONTAINED FIRE HOSE

Robert Brooks, 2 Caldwell St., Weymouth, Mass. 02191

Filed Oct. 26, 1981, Ser. No. 314,700
Int. Cl.³ A47B *77/02*
U.S. Cl. 312—228 **3 Claims**



1. A means for storing a fire hose in a bathroom comprising in combination a bathroom vanity having a means providing a water supply, a container shaped and mounted on the wall of said bathroom vanity;

an elongated hangar;

means for pivotally supporting said hangar for movement from a position within said container to a position in which one end of the hanger extends out of said container;

a plurality of closed rings through which said hose extends with said hose folded in an accordion-like configuration and with said rings parallel to one another and engaging said hose at successive adjacent loops formed by said accordion-like folds;

said hanger extending through said successive rings supporting said hose whereby the hose may be pulled from the cabinet with successive segments of said hose defined by said rings being disengaged from said hanger as the rings are removed from said hanger and said means for providing a water supply including a pipe connected to one end of said hose and have a coupling for connecting to the water supply for said bathroom, a valve for controlling the flow of water through said pipe and means securing said pipe to said container.

4,429,932

DESK TOP ORGANIZER

V. Jack Brennan, P.O. Box 70639, Pasadena, Calif. 91107

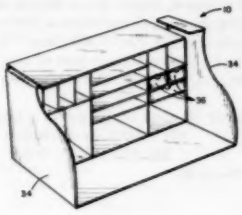
Filed Jun. 17, 1982, Ser. No. 389,273
Int. Cl.³ A47B *43/02, 63/04*
U.S. Cl. 312—259 **5 Claims**

1. In a desk top organizing device placeable on a desk top, or the like comprising:

(a) a plurality of sub-assembled partitions, folded in halves along their center lines, respectively and mounted parallely, respectively perpendicularly to one another to form a plurality of double walled compartments;

(b) a tray, foldable for containment of and attachment around the sub-assembly of the partitions, providing bottom, side, top and back supportive surfaces therefor;

(c) an elongated wrap, having a rectangular center portion and two curved lateral portions, the width of which is greater than that of the supportive bottom and side surface of the partition sub-assembly containing tray, around which it is wrapped for attachment thereto, so as to provide forwardly projecting winged sides for and an extension of the bottom supportive surface of the tray.

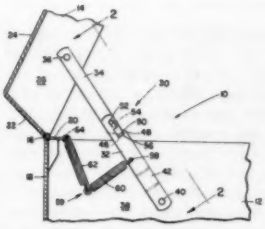


4,429,933

CLOSING MECHANISM FOR A CABINET COVER

Eugene K. Sokolowski, 2415 N. Oak Park Ave., Chicago, Ill. 60635

Filed Jan. 9, 1981, Ser. No. 223,873
Int. Cl.³ B65D *43/24;* E05C *17/32*
U.S. Cl. 312—319 **4 Claims**



1. A closing mechanism (30) for a cabinet (10) having a base (12) and a cover (14) hinged to the base (12) wherein first and second elongated links (32, 34) are pivotally joined together at their first ends with a second end of the first link (32) being pivotally connected to the base (12) of the cabinet (10) and a second end of the second link (34) is connected to the cabinet cover (14) comprising:

an articulated biasing means (59) coupled to one of said links (32) and to said cabinet (10) and having a relaxed condition when the cover (14) is open and an active biasing condition as the cover (14) closes to urge the cover (14) to its open condition during closure, and

said articulated biasing means (59) includes a first (60) and a second (62) elongated coil spring, a first end of said first coil spring (60) being pivotally connected to a first end of said second coil spring (62), a second end of said first coil spring (60) being connected to one of said first and second links (32) and a second end of said second coil spring (62) being connected to the base (12) of said cabinet (10), whereby said coil springs (60, 62) are relaxed and articulated at their common connection when said cover is open allowing said coil springs (60, 62) to move to a position which will not interfere with said cover (14) or said links (32, 34).

4,429,934
PANEL WIRING SYSTEM

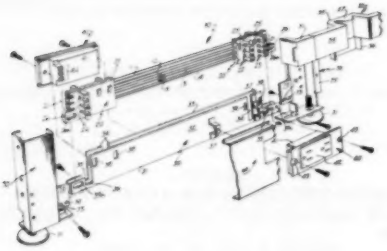
Harold L. VandenHoek, Grand Rapids; Larry A. Speet, Holland, and Robert G. Mohr, Grand Rapids, all of Mich., assignors to Steelcase Inc., Grand Rapids, Mich.

Continuation of Ser. No. 79,490, Sep. 27, 1979, Pat. No. 4,376,561, and a continuation-in-part of Ser. No. 909,975, May 26, 1978, Pat. No. 4,203,639. This application Feb. 22, 1982, Ser. No. 351,167

The portion of the term of this patent subsequent to May 20, 1997, has been disclaimed.

Int. Cl.[3] H01R *39/00*

U.S. Cl. 339—22 R 27 Claims



1. In a panel system comprised of at least two free standing movable room divider panels having enclosed electrical wiring, the improvement comprising: each of said panels having first wiring means defining a first circuit extending generally from one end edge of said panel to the other; second wiring means defining a second circuit extending generally from one end edge of said panel to the other; at least one connector mounted in each of said panels, and including first, second and third sets of quick disconnect terminals; said first set of quick disconnect terminals having a configuration which is not that of a conventional plug receptacle, and being electrically connected with said first wiring means for connecting lighting to said first circuit; lighting means mounted on at least one of said panels and including a fourth set of quick disconnect terminals matingly joined to said first set of quick disconnect terminals, whereby current is delivered to said lighting means through said first wiring means; said second set of quick disconnect terminals, having a configuration which is not that of a conventional plug receptacle, and being electrically connected with said second wiring means for connecting conventional plug receptacles to said second circuit; a conventional plug receptacle mounted on at least one of said panels, and having a fifth set of quick disconnect terminals matingly joined to said second set of quick disconnect terminals, whereby current is delivered to said conventional plug receptacle through said second wiring means; the configuration of said first set of quick disconnect terminals being different from the configuration of said second set of quick disconnect terminals, whereby said lighting means and said conventional plug receptacles cannot be inadvertently connected to a circuit not intended for them; said third set of quick disconnect terminals being electrically connected to both said first and second wiring means to facilitate electrical connection of both the first and second circuits in one panel to those in another panel; and panel power connector means joining said third set of quick disconnect terminals on the connector of one panel to the third set of quick disconnect terminals on the connector of the other panel.

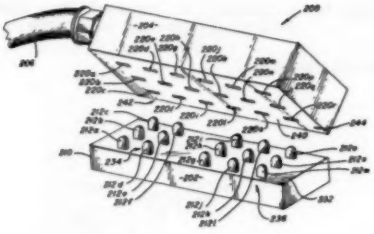
4,429,935
MULTI-POSITION ELECTRICAL CONNECTOR

John D. Lamb, Lafayette, and Robert A. Chopko, Liverpool, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Sep. 28, 1981, Ser. No. 306,446

Int. Cl.[3] H01R *29/00*

U.S. Cl. 339—32 M 6 Claims



1. An electrical connector for use with an electric device including first and second winding sections and a plurality of lead wires connected to the winding sections, the connector comprising:

a plug including

a base defining a longitudinal axis,

a first set of blades extending outward from the base,

first jumper means electrically connecting blades in the first set thereof,

a second set of blades extending outward from the base, and

second jumper means electrically connecting blades in the second set thereof; and

a socket defining

a first set of receptacles receiving the first set of blades, and

a second set of receptacles receiving the second set of blades;

the socket including

means for connecting a first subset of the first set of receptacles to a first voltage source,

means for connecting a second subset of the first set of receptacles to a second voltage source,

means electrically connecting the first set of receptacles to the second set of receptacles, and

means for connecting the second set of receptacles to the lead wires;

the plug and socket having first and second longitudinally spaced apart connected positions, wherein

in the first connected position, the first subset of the first set of receptacles coacts with the first jumper means and the means electrically connecting the first set of receptacles to the second set of receptacles to connect the first voltage source to the second set of receptacles and the second jumper means coact with a first combination of the second set of blades and second set of receptacles for connecting the winding sections in parallel, and

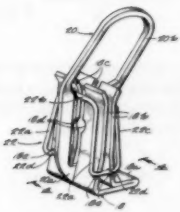
in the second connected position, the second subset of the first set of receptacles coacts with the first jumper means and the means electrically connecting the first set of receptacles to the second set of receptacles to connect the second voltage source to the second set of receptacles and the second jumper means coact with a second combination of the second set of blades and second set of receptacles for connecting the winding sections in series.

4,429,936

SPRING JAW FUSE CLIP AND INTEGRALLY RETAINED FUSE PULLER

James J. Rusenko, Milwaukee, and Marian M. Rzepecki, Brown Deer, both of Wis., assignors to Eaton Corporation, Cleveland, Ohio

Filed Apr. 7, 1982, Ser. No. 366,437
Int. Cl.³ H01R 13/633
U.S. Cl. 339—45 R 12 Claims



1. A spring jaw fuse clip and a fuse puller integrally retained thereto comprising, in combination:

a base;

a pair of spaced legs extending upwardly from said base and having transversely aligned vertical slots open to the upper ends of the respective legs;

a backup spring engaging outer surfaces of said legs for biasing said legs inwardly, said spring having a portion spanning the respective slot in at least one leg;

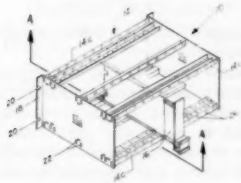
an insulating loop comprising a planar U-shaped lower portion disposed in said slots transversely of said legs and an upper handle portion extending above the upper ends of said legs, the bight of said U-shaped lower portion extending across the space between said legs and being disposed in proximity to lower ends of said slots for positioning below a fuse blade inserted between said legs, said bight driving the fuse blade from engagement between said legs when said insulating loop is pulled upwardly, and said bight abutting said backup spring at said portion thereof spanning said respective slot to limit upward movement of said insulating loop.

4,429,937

CIRCUIT BOARD MODULE MOUNTING UNIT

Edward F. Stockmaster, Mentor, Ohio, assignor to The Babcock & Wilcox Company, New Orleans, La.

Filed Jul. 22, 1981, Ser. No. 286,106
Int. Cl.³ H05K 7/14
U.S. Cl. 339—65 10 Claims



1. A module mounting unit for mounting a series of circuit board control modules comprising:

a pair of side plates;

a first bracket mounted between the lower front corners of said pair of side plates to have a series of apertures along the face of said bracket;

a second bracket mounted between the upper front corners of said pair of side plates;

a series of support brackets spacedly-mounted along the lengths of said pair of side plates to separate said plates and having a series of circular and oval holes along the same face of the support bracket; and

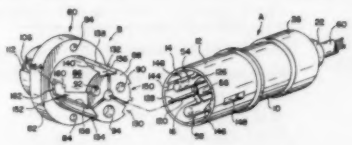
a series of channel strips parallel-mounted across the circular and oval holes of said series of support brackets to form guideways for the circuit boards of said circuit board control modules.

4,429,938

LOCKING DEVICE FOR INTERFITTING MEMBERS

Joseph R. Flor, Livingston, N.J., assignor to Midland-Ross Corporation, Cleveland, Ohio

Filed Jan. 6, 1982, Ser. No. 337,378
Int. Cl.³ H01R 13/625
U.S. Cl. 339—90 R 30 Claims



1. A device for automatically locking cooperative first and second members in an axially interconnected relationship, at least a generally cylindrical male portion of said first member from a first terminal end being axially receivable in a generally cylindrical female portion of said second member from a second terminal end, said device comprising:

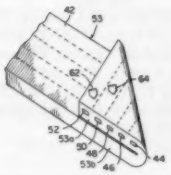
one of said male and female portions including a plurality of spring members cooperable with a plurality of activating means on the other of said male and female portions, said spring members and said activating means being spaced apart circumferentially around the associated of said male and female portions, said spring members being placed in direct activating engagement with said activating means as said male portion is axially inserted into said female portion for causing said biasing means to be moved from a first normal position toward a second biasing position exerting a biasing force to urge relative rotation between said male and female portions; and, locking means cooperable between said male and female portions selectively movable from a first non-locking to a second locking condition, said locking means being automatically moved to said locking condition when a predetermined length of said male portion is received in said female portion and said male and female portions are relatively rotated under the influence of said biasing means.

4,429,939

ELECTRICAL CABLE ASSEMBLY

Raymond F. Piasecki, Leonardo, N.J., assignor to Thomas & Betts Corporation, Raritan, N.J.

Filed Sep. 9, 1981, Ser. No. 300,466
Int. Cl.³ H01R 11/20
U.S. Cl. 339—97 C 24 Claims



1. An electrical cable assembly comprising an elongate flat cable having a plurality of electrical conductors and electrical

insulation about said conductors, first and second courses of said cable situated in mutually overlapping relation defining zones of interconnection registry for said conductors, and electrical connector means interconnecting together selected different ones of such conductors at said registry zones.

4,429,940

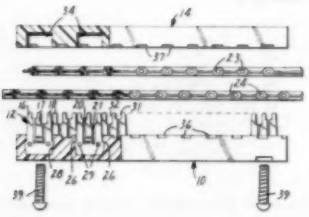
TAP CONNECTOR

Lane A. Freshwater, Lino Lakes, and Eugene E. Moynagh, Afton, both of Minn., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Nov. 27, 1981, Ser. No. 325,348

Int. Cl.³ H01R *9/09*

U.S. Cl. 339—99 R **11 Claims**



1. A tap connector for tapping branch conductors to conductors of a bus cable, comprising:

an insulating base,

a plurality of tap contacts retained in said base, each said contact comprising a flat metal plate having three parallel, closely spaced legs extending from one edge, the two outer legs lying in a common plane and the center leg lying in a plane parallel to said common plane and offset therefrom by a distance at least equal to the thickness of said plate, the outer legs being spaced from the center leg to create two parallel sided conductor connecting slots of lesser width than the conductors to be connected for electrically connecting a branch conductor to a conductor of a bus cable, said contact legs being relieved at their free ends along their edges facing the conductor connecting slots to define wire retention areas of a width greater than the conductors to be connected to engage the insulation on the conductors and the inner edge of one outer leg and the adjacent edge of the center leg of each contact being relieved further along the conductor connecting slot a distance generally equal to the diameter of the insulated conductors to be connected, said contacts being positioned in said insulating base to connect a plurality of parallel, equally spaced conductors of a bus cable to a plurality of parallel equally spaced branch conductors at an angle to the conductors of the bus cable, and

an insulating cover having receptacles for the ends of said tap contacts to permit said cover to force the bus and branch conductors into said conductor connecting slots in said contacts when said cover is placed over said base and they are pressed together.

4,429,941

CABLE CLAMPING ARRANGEMENT FOR AN ELECTRICAL CONNECTOR

Norman Bottoms, Wilmslow, England, assignor to International Computers Limited, London, England

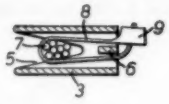
Filed Apr. 17, 1981, Ser. No. 255,098

Claims priority, application United Kingdom, May 6, 1980, 8015043; Aug. 12, 1980, 8026233

Int. Cl.³ H01R *13/58*

U.S. Cl. 339—103 M **3 Claims**

1. A cable clamping arrangement including; a structure of hollow cross-section having a pair of spaced apart opposite sides, each side having a first end and a second end opposite said first end; an acute angled V-shaped notch in each of the opposite sides, the notches being aligned with one another and having their respective wider ends at the first end of each side; and means extending through the hollow structure in a direction away from the first ends for engaging the cable and urging



it into the notches so as to wedge it therein and thereby clamp it to the structure, the means including a flexible tie extending around the cable and a constriction in the interior of the hollow structure effective to secure the tie.

4,429,942

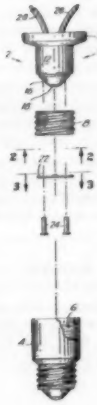
THREADED LAMP ADAPTER

George E. Johnson, Bronxville, and Walter Newman, Forest Hills, both of N.Y., assignors to Leviton Manufacturing Co., Inc., Little Neck, N.Y.

Continuation of Ser. No. 211,620, Dec. 1, 1980, Pat. No. 4,360,243. This application Sep. 20, 1982, Ser. No. 420,202

Int. Cl.³ H01R *13/02*

U.S. Cl. 339—154 L **5 Claims**



1. A connector for adapting a lamp to be threaded into a lighting fixture comprising:

a body adapted to receive first electrical conductor means connectable to an energizing terminal of said lamp,

a sleeve having threads at least on its exterior surface for connection to a threaded light socket and rotatably mounted on said body, said body including retaining means for limiting axial movement between said body and said sleeve,

first resistance means on said body member, and

second resistance means on said sleeve member,

said first and second resistance means operating to increase the torque necessary to rotate said sleeve relative to said body when said sleeve is in a predetermined disposition relative to said body, said first and second resistance means comprising a projection and the other of said first and second resistance means has an opening adapted to receive said projection, and, said first resistance means being formed on said retaining means.

4,429,943

INSULATION BOX FOR WIRE HARNESS CONNECTOR DEVICE

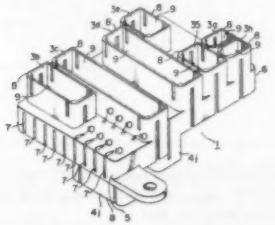
Nori Inoue, Suzuka, Japan, assignor to Tokai Electric Wire Company Limited, Yokkaichi, Japan

Filed Nov. 13, 1981, Ser. No. 321,228

Claims priority, application Japan, Nov. 14, 1980, 55-161266; Dec. 5, 1980, 55-175365[U]; Feb. 10, 1981, 56-17430[U]; Feb. 25, 1981, 56-25633[U]; Apr. 4, 1981, 56-48996[U]

Int. Cl.³ H01R *9/00*

U.S. Cl. 339—198 R 7 Claims



1. An insulation box for connecting wire harnesses to a plurality of conductive strip members, comprising:

front and rear walls having a plurality of conductive strip insertion slots each communicating with one of a plurality of substantially parallel passages defined in said insulation box for holding the plurality of conductive strip members in a spaced, side-by-side, substantially parallel relationship;

a top wall connected to top ends of said front and rear walls and extending in a plane substantially parallel to the plane of said substantially parallel passages;

a bottom wall connected to bottom ends of said front and rear walls and extending in a plane substantially parallel to the plane of said substantially parallel passages;

at least one of said top and bottom walls having connector fitting openings formed therethrough for connecting the wire harnesses to said conductive strip members; and

apertures formed in at least one of said top and bottom walls and communicating with said passages;

said connector fitting openings and said apertures being so arranged in relation to each other that the passages are opened to the exterior of the insulation box through at least one of said connector fitting openings and said apertures at any point along the length of said passages.

4,429,944

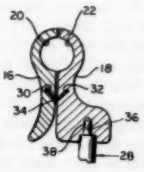
BATTERY POST CLAMP

Joseph P. Bell, Rte. 1, Box 262D, Grayslake, Ill. 60030

Filed Aug. 6, 1981, Ser. No. 290,476

Int. Cl.³ H01R *11/11*

U.S. Cl. 339—228 3 Claims



1. In a battery terminal clamp of the type in which a pair of conductive clamping members have cooperable recesses for engaging a battery terminal and the clamping members are pivoted at and biased towards a grouping relationship with respect to a battery terminal by a spring and are maintained in alignment by an alignment member coupling both clamping members together, the improvement therein of maintaining the functions of the spring and alignment member while combining the same in a single element, comprising:

a V-shaped spring connecting both clamping members and providing a holding connection therebetween, while simultaneously providing the bias and the alignment of the clamping members, a slot in each of said clamping members, and said V-shaped spring including a pair of flat legs each press fit in a respective slot.

4,429,945

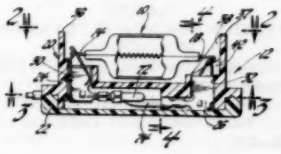
TERMINAL FOR BASELESS CARTRIDGE LAMP SOCKETS

Charles R. Nestor, Niles, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Jan. 20, 1982, Ser. No. 341,117

Int. Cl.³ H01R *33/08, 33/12, 11/22*

U.S. Cl. 339—252 R 3 Claims



1. A terminal for engaging and supporting a wire loop terminal or a wire hook terminal of a baseless cartridge lamp or the like, comprising;

a base having a spring tongue integrally attached to a forward edge of the base,

a side wall integrally attached to a side edge of the base,

said side wall having a flange juxtaposed the spring tongue for limiting deflection of the spring tongue in one direction and a second flange spaced from the spring tongue in the opposite direction,

said spring tongue having a free end which extends beyond the side wall and flanges and which is bent to provide a hook for engaging and supporting either a wire loop terminal or a wire hook terminal,

a spring support which extends from the free end of the spring tongue and slideably engages the second flange to increase the spring forces when the spring tongue is deflected in the opposite direction, and

and inturned foot at the end of the spring support which engages the spring tongue to limit the deflection of the spring tongue in said opposite direction.

4,429,946

METHOD AND SYSTEM FOR CONSTRUCTING A COMPOSITE HOLOGRAM

Kenneth A. Haines, Santa Clara, Calif., assignor to Eidetic Images, Inc., Santa Clara, Calif.

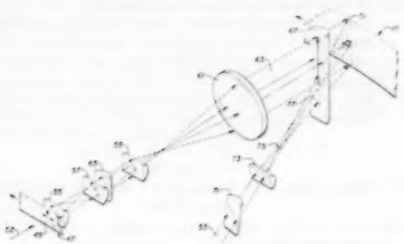
Division of Ser. No. 73,181, Sep. 7, 1979, Pat. No. 4,364,627. This application Jul. 22, 1982, Ser. No. 400,614

Int. Cl.³ G03H *1/28, 1/30*

U.S. Cl. 350—3.76 5 Claims

1. In the method of making a composite hologram of a large number of individual lenticular holograms, said holograms having narrow widths and a common height and joined together at their sides into a drum-like shape having a radius "R" and a center axis, wherein an apparent image of a three-dimensional object is reconstructed within said drum shape by illuminating the hologram from beneath by a white light source, said source having a maximum width "W" and positioned substantially on said center axis, the improvement wherein: the spac-

ing of the adjacent lenticular hologram elements is made to be substantially within a range of $\sqrt{\lambda R}$ as an upper limit and $\lambda R/W$ as a lower limit, wherein "λ" is any wavelength of



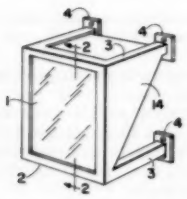
visible light, thereby to minimize the effect and visibility of undesirable vertical liens that exist superimposed over the image.

4,429,947

REFLECTION MOUNT FOR TRANSMISSION HOLOGRAMS

Stephen A. Benton, Lincoln, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Apr. 13, 1981, Ser. No. 253,671
Int. Cl.³ G03H *1/22*; G02B *27/2*
U.S. Cl. 350—3.85 **9 Claims**



1. Apparatus for illuminating a transmission hologram for viewing by an observer facing the hologram on a first side thereof, comprising: means for mounting a transmission hologram in a plane generally normal to the intended line of sight of the observer; a source of light located on the same side of said mounting means as the intended location of the observer and directing light toward said mounting means along paths displaced from the paths of light from the general direction of the intended observer; reflecting means; means for mounting said reflecting means on a second side opposite the first side of the hologram in position to form a virtual image of said source on said second side of said hologram; light absorbing means; and, means for mounting said light absorbing means adjacent said reflecting means to absorb light coming from the general direction of the intended location of an observer and reflected by said reflecting means.

4,429,948

OPTICAL ALIGNMENT COMPENSATION

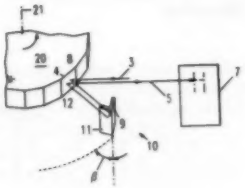
Richard L. Garwin, Scarsdale, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed May 14, 1981, Ser. No. 263,648
Int. Cl.³ G02B *27/17*
U.S. Cl. 350—6.8 **5 Claims**

1. In apparatus providing a raster scan of a surface by a beam of light, said raster scan being made up of a series of side to side movements of said light beam combined with incremental advancement of said surface in an orthogonal direction to said side to side movements and wherein the said side to side movements of said light beam are produced by reflection in the path between the source of said light and said surface of said light beam along a light path direction on a moving reflecting member,

the improvement for selective control of the length of said side to side movements comprising

at least one dihedral mirror assembly having reflecting surfaces that intersect in a line,



means positioning said assembly with said line perpendicular to the said light path direction of said moving reflecting member, and

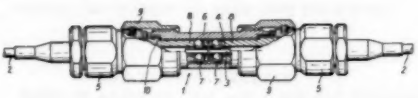
means positioning one of said intersecting reflecting surfaces of said dihedral mirror at a side to side light beam movement length determining angle with respect to said moving reflecting member.

4,429,949

CONNECTOR FOR OPTICAL FIBERS WHEREIN INDIVIDUAL FIBER IS CENTERED BY A PLURALITY OF BALLS

Jacques Cartier, Fontenay-Sous-Bois, France, assignor to Radiall, Rosny-Sous-Bois, France

Filed Sep. 9, 1980, Ser. No. 185,876
Claims priority, application France, Sep. 18, 1979, 79 23200
Int. Cl.³ G02B *7/26*
U.S. Cl. 350—96.21 **8 Claims**

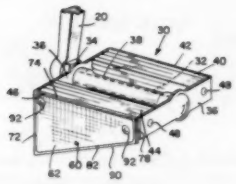


1. A connector for optic fibers with an elastic sheath, comprising in combination, a rigid sleeve having an axis, a first optic fiber having an end within said sleeve, an elastic sheath on said fiber adjacent said end, means for radially centering said fiber relative to said sleeve and comprising, a set of balls between said sleeve and said elastic sheath, said balls each engaging the inside of said sleeve and the outside of said sheath and being disposed near the end of the fiber with their centers in a common plane perpendicular to the axis of said sleeve, said set of balls cooperating with the inside of said sleeve to define a space along the axis of the sleeve which is slightly less than the external diameter of said elastic sheath so that said first optic fiber is centered in said sleeve by means of radial compression of the elastic sheath by said balls, a second optic fiber having an end facing toward the end of the first optic fiber, and means for radially centering the end of the second optic fiber relative to the axis of said sleeve.

4,429,950
BICYCLE PEDAL REFLECTOR

Helmut T. Zwahlen, 3 Canterbury Dr., Athens, Ohio 45701

Filed May 20, 1982, Ser. No. 380,417
Int. Cl.³ G02B 5/12; G05G 1/14
U.S. Cl. 350—99 18 Claims

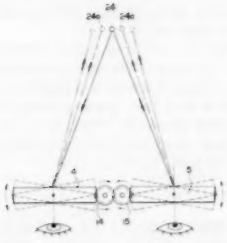


1. A reflector for a pedal mounted to the crank of a bicycle, the pedal having front and rear facing pedal surfaces, the reflector comprising a reflectorized member having a reflective area greater than one of the front and rear facing pedal surfaces, and mounting means for mounting the reflectorized member on the one pedal surface, the reflectorized member including a proximal side adjacent to the crank when mounted on the one pedal surface and a bottom forming an acute angle with respect to the proximal side.

4,429,951
SPECTACLES FOR GIVING TWO-DIMENTIONAL TELEVISION OR MOTION PICTURES THREE-DIMENSIONAL APPEARANCE

Kichinosuke Hirano, 35-5 Kita-Karasuyama, 4-chome, Setagaya-ku, Tokyo, Japan

Filed Aug. 6, 1980, Ser. No. 175,858
Claims priority, application Japan, Dec. 5, 1979, 54-157877
Int. Cl.³ G02B 27/22; G02C 7/08
U.S. Cl. 350—144 6 Claims

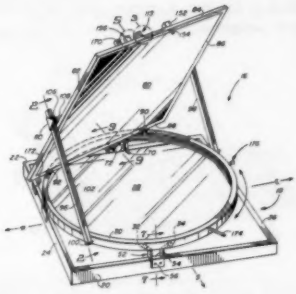


1. Spectacles for giving a two-dimensional motion picture or television picture a three-dimensional appearance when worn in front of a wear's left and right eyes, said spectacles comprising a frame means for supporting a pair of lenses including a left lens and a right lens, means for shifting the image of the picture projected through the left lens to the right and the image of the picture projected through the right lens to the left, said image shifting means including a pair of refracting lenses including a left refracting lens and a right refracting lens, having respective first vertical axes located in the respective planes of said left and right refracting lenses, mounted on said frame means, for pivotal movement around said respective vertical axes and means, mounted to said frame means, for pivoting said pair of refracting lenses through equal angles around said respective vertical axes in opposite directions.

4,429,952
TRACKING REFLECTOR ASSEMBLY FOR A SKYLIGHT

Richard L. Dominguez, 3835 W. Eva Ave., Phoenix, Ariz. 85021

Filed Dec. 28, 1981, Ser. No. 335,173
Int. Cl.³ G02B 17/00, 27/00
U.S. Cl. 350—258 20 Claims



1. A skylight reflector assembly for usage with a conventional skylight and adapted to track daily and seasonal movements of the sun, the skylight including a light transmissive panel having a center portion and supported within a frame, said skylight reflector assembly comprising in combination;

a. a ring of a diameter commensurate with the width of the skylight frame;

b. a plurality of rollers disposed above the skylight frame for rotatably supporting said ring above the light transmissive panel of the skylight, said plurality of rollers allowing said ring to rotate about an axis substantially perpendicular to the center portion of the light transmissive panel;

c. said ring including a track for engaging said plurality of rollers to allow said ring to rotate relative to the skylight;

d. a plurality of support brackets secured to the skylight frame for supporting said plurality of rollers, each of said support brackets having at least one of said rollers secured thereto;

e. a reflector pivotally coupled to said ring for reflecting sunlight through the light transmissive panel of the skylight in addition to sunlight which strikes the light transmissive panel directly, said reflector being pivotally movable between a closed position overlying and shading the light transmissive panel of the skylight and an opened position allowing sunlight to pass through the light transmissive panel;

f. vertical drive means coupled to said reflector for pivoting said reflector relative to said ring;

g. horizontal drive means coupled to said ring for rotating said ring as well as said reflector pivotally coupled thereto; and

h. control means responsive to the position of the sun for controlling said vertical drive means and said horizontal drive means to cause said reflector to track movements of the sun.

4,429,953
CURVED GLASS REFLECTOR AND METHOD OF MAKING SAME

Theodore F. Zehnpfennig, Wayland, and William P. Reidy, Bedford, both of Mass., assignors to Visidyne, Inc., Burlington, Mass.

Filed Sep. 29, 1980, Ser. No. 191,508
Int. Cl.³ G02B 5/10
U.S. Cl. 350—293 6 Claims

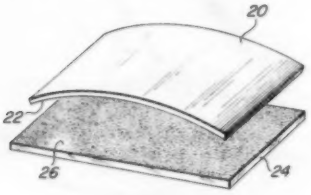
1. A method of forming a curved, glass reflector having a curve depth d' comprising:

forming, in a metal leaf spring backing plate having a stiffness S_2, a curved surface having a curve depth d;

bonding to said curved surface a flat glass plate having a stiffness S_1; and

after bonding, permitting said bonded plates to adjust to an equilibrium curved formation in which the curve depth is d' where $d'=d/R$ and R is the ratio of $(S_1+S_2)/S_2$.

2. A method of forming a curved, glass reflector having a curve depth d' comprising:



forming, in a glass backing plate having a stiffness S_2, a curved surface having a curve depth d;

bonding to said curved surface a flat glass plate having a stiffness S_1; and

after bonding, permitting said bonded plates to adjust to an equilibrium curved formation in which the curve depth is d' where $d'=d/R$ and R is the ratio of $(S_1+S_2)/S_2$.

4,429,954

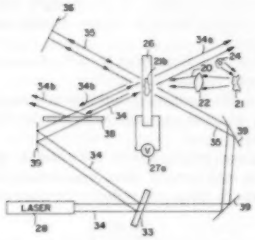
SPATIAL LIGHT MODULATOR AND PROCESS OF MODULATION

H. John Caulfield, Nagog Woods, Mass., and W. Thomas Cathey, Boulder, Colo., assignors to Aerodyne Research, Inc., Billerica, Mass.

Filed Nov. 5, 1980, Ser. No. 203,568

Int. Cl.³ G02F *1/29*; G03H *1/22*

U.S. Cl. 350—3.64 **35 Claims**



1. A method of spatial light modulation to impart information to a beam of coherent radiation from an input of non-coherent radiation, comprising

imaging information-containing non-coherent radiation on a photosensitive crystal while applying an electric potential to said crystal to generate a pattern of electric charge within said crystal, and

directing to said crystal at least one beam of coherent radiation, thus bringing about patternwise modification of refraction of said coherent beam.

4,429,955

PASSIVE ELECTRO-OPTICAL DISPLAY WITH SCREEN AND CONTROL ELECTRODES

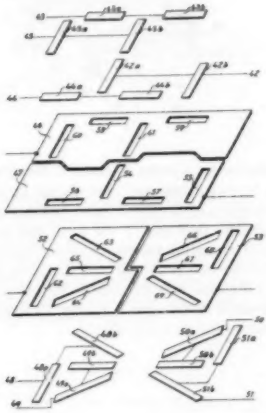
Hubert Portmann, Rothenburg, Switzerland, assignor to Asulab S.A., Neuchatel, Switzerland

Filed Sep. 1, 1981, Ser. No. 298,495

Claims priority, application Switzerland, Sep. 15, 1980, 6897/80

Int. Cl.³ G02F *1/13*

U.S. Cl. 350—332 **3 Claims**



1. A passive electro-optical display cell comprising:

first and second spaced plates, at least one of which is transparent;

a layer of a passive electro-optical material interposed between said first and second plates;

control electrodes positioned on the inner face of each of said plates; and

at least one screen electrode positioned between each of said control electrodes and said electro-optical material layer, each screen electrode being provided with openings facing a part of the surface of each control electrode associated therewith, said openings defining the shapes of segments to be displayed;

at least the first plate carrying at least two screen electrodes, at least two openings of the screen electrode of the second plate being disposed facing a common control electrode, each of said at least two openings being disposed facing a different screen electrode of said first plate, the openings associated with any one of the control electrodes being all formed in the same screen electrode.

4,429,956

WET CORNEA TELESCOPE

M. Linton Herbert, 762 E. Michigan Ave., Orlando, Fla. 32806

Continuation of Ser. No. 113,498, Jan. 21, 1980, abandoned. This application Apr. 19, 1982, Ser. No. 369,898

The portion of the term of this patent subsequent to Jun. 15, 1999, has been disclaimed.

Int. Cl.³ G02B *3/12, 17/00, 21/04, 23/02*

U.S. Cl. 350—410 **40 Claims**

1. A wet cornea telescope for permitting a viewer to see a magnified image of a remotely positioned object aligned with the optical axis of the telescope, comprising:

a. a liquid-filled eyepiece coupled to the face of the viewer for forming an optically transparent, liquid-filled chamber, said eyepiece including

i. a flat, substantially non-magnifying, optically transparent window aligned with the optical axis of the telescope and spaced apart from the cornea of said eye;

ii. a sidewall for maintaining said window spaced apart from said eye, said sidewall having a continuous front end surface for forming a leak-free seal between said eyepiece and said window and a continuous rear end surface for forming a leak-free seal between said eyepiece and the viewer's face; and

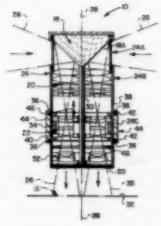
b. means interposed in the optical path between the object and said eyepiece for converging light rays traveling from the object to the viewer's eye to thereby project a magnified image of the object on the viewer's retina.

4,429,957

PANORAMIC ZOOM LENS ASSEMBLY

Don G. King, Lewisville, Tex., assignor to King-Bell Optics, Inc., Lewisville, Tex.

Filed Jul. 30, 1981, Ser. No. 288,656
Int. Cl.³ G02B *13/06, 15/14*
U.S. Cl. 350—423 **1 Claim**



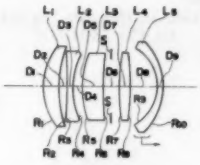
1. A zoom lens assembly for focusing the image of a panoramic view onto an image plane comprising, in combination:
- a cylindrical housing having a transparent sidewall zone and an opaque sidewall zone;
- a reflector mounted in said housing in optical communication with the transparent sidewall zone, said reflector having a symmetrical, reflective surface of revolution the axis of which is transverse to the image plane;
- a first annular lens mounted with said housing in a position surrounded by said opaque sidewall zone;
- a guide tube received within said housing and extending along the axis of said reflector through said first annular lens;
- a second annular lens received within said housing and movably mounted in concentric alignment with said first annular lens for reciprocal movement along said guide tube between the first annular lens and the image plane; and,
- carriage means received within said housing and mounted for movement along said guide tube, said second annular lens being mounted onto said carriage means.

4,429,958

RELATIVELY WIDE ANGLE TELEPHOTO TYPE LENS SYSTEM

Tamikazu Yamaguchi, Sakai, Japan, assignor to Minolta Camera Kabushiki Kaisha, Higashi, Japan

Filed Mar. 17, 1981, Ser. No. 244,341
Claims priority, application Japan, Mar. 24, 1980, 55-37775; Aug. 22, 1980, 55-116282
Int. Cl.³ G02B *9/60, 9/62, 15/14*
U.S. Cl. 350—455 **30 Claims**



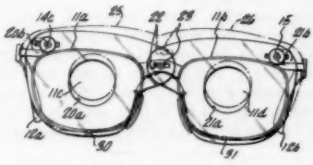
1. A telephoto type relatively wide angle lens system, with the object side principal point located outside the lens system, comprising, from the object to image side:
- a first positive lens component having a convex object side surface and a concave image side surface;
- a second negative lens component;
- a third positive lens component;
- an aperture stop; and
- a plurality of lens components at the image side of the aperture stop including a rearmost negative lens component having a concave object side surface and a convex image side surface, the rearmost negative lens component being shiftable along the optical axis for focusing.

4,429,959

SPECTACLE MOUNTED HINGED MONOCULAR OR BINOCULAR VISION AID

Samuel Walters, 3134 Dona Emilia Dr., Studio City, Calif. 91604

Filed Nov. 9, 1981, Ser. No. 319,271
Int. Cl.³ G02C *7/08, 1/00*
U.S. Cl. 351—158 **9 Claims**



1. A visual aid device adapted to be hingeably attached to spectacle frames and for mounting one or more monoculars through which the eye or eyes of the wearer can view objects comprising
- first and second plates, said plates being generally in the shape of a conventional spectacle lens but including a lip on one side and wherein the lips of the plates can be overlapped to provide a central pivot point and hinge, and
- each of said plates having a first elongated hole at a side substantially opposite the lip of the respective plate, and the lips of each plate having a second elongated hole forming said pivot point, at least one of said plates having a substantially central aperture for receiving a monocular, and said first elongated holes being adapted to be secured to a hinge member attached to respective frame sections of spectacles and to allow, along with holes in the lips, pupil distance to be adjusted and set, and said second holes in

said lips adapted to receive a fastener to lock said plates in a predetermined relationship for allowing the plates to be moved up and down with respect to the pupils of a wearer's eye.

4,429,960

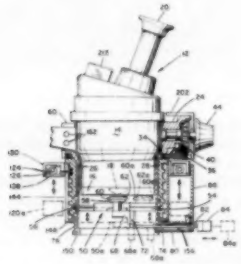
KERATOMETRIC DEVICE

Joseph P. Mocilac, 11785 Telephone Ave., Chino, Calif. 91710; Clifford M. Terry, 7087 Columbus Dr., Anaheim, Calif. 92807, and John G. Mesaros, 18142 Hallsworth Cir., Villa Park, Calif. 92667

Filed Oct. 31, 1980, Ser. No. 202,458

Int. Cl.³ A61B *3/10*

U.S. Cl. 351—212 **17 Claims**



8. In a keratometric device for measuring the radius of curvature of a spherical object and for use with a binocular microscope having objective lens means, the combination comprising:

a housing member configured for attachment to the microscope, said housing member having a cylindrical shell portion;

a generally cylindrical elevator member configured for mounting about said shell portion for rotation relative thereto, said elevator member having a first screw thread on the exterior thereof and a second screw thread on the interior thereof;

reference image projection means operatively coupled to said first screw thread;

prism slide assembly means operatively coupled to said second thread, said prism slide assembly means including prism means in the optical path of said microscope;

means coupled to said housing member for rotating said elevator member and moving said reference image projection means and said prism slide assembly means concurrently relative to the objective lens of said microscope.

4,429,961

VISUAL FIELD TESTING DEVICE

Larry A. Sheingorn, 3139 Tennyson St., NW., Washington, D.C. 20015

Filed Aug. 14, 1981, Ser. No. 292,909

Int. Cl.³ A61B *3/02*

U.S. Cl. 351—226 **4 Claims**

1. In an apparatus for automatically testing visual fields comprising:

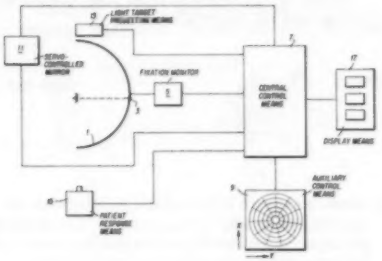
a bowl perimeter having an axis through its centerpoint;

means for locating the head of a patient being test so that the axis of the patient's eye is approximately alinged with the axis of said bowl perimeter;

a light source for projecting a target spot to a desired point of projection within said bowl perimeter;

control means for moving the position of the target spot projection point relative to said bowl perimeter and for selectively projecting the target spot onto said bowl perimeter to determine points defining the visual field of the patient;

the improvement comprising:



auxiliary control means for generating data signals in response to a manually positioned marker placed on any point on a visual field chart and for transmitting said signals to said control means.

4,429,962

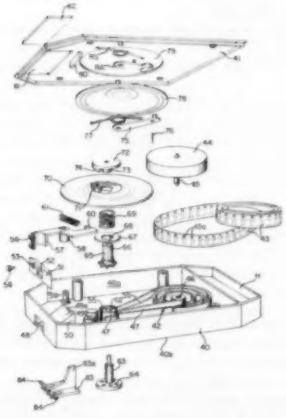
SOUND MOTION PICTURE APPARATUS WITH REMOVABLE CARTRIDGE

Joseph W. Blake, III, New Canaan, Conn., assignor to Kenjamin Kinberg, New York, N.Y.

Filed Aug. 31, 1981, Ser. No. 298,088

Int. Cl.³ G03B *31/04*

U.S. Cl. 352—32 **10 Claims**



1. In a motion-picture apparatus, in combination,

a housing;

a cartridge removably mountable in said housing and including an aperture, a length of motion-picture film in the cartridge, and means for advancing said film frame-wise past said aperture;

cooperating means on said housing and cartridge for operating said advancing means;

means for reproducing a sound-track which is correlatable with the action on said length of motion-picture; and

means for continuously, automatically correlating said sound-track with the action on said length of motion-picture film even when, at a random midpoint in the length of the film, operation of the apparatus has been stopped without removal of the cartridge and then recommenced

or operation has been stopped, the cartridge removed and reinserted and then operation recommenced.

4,429,963

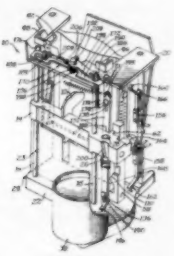
SLIDE TRANSFER AND SHUTTER CONTROL ARRANGEMENT FOR SLIDE PROJECTOR

Nicholas Mischenko, Mt. Prospect, Ill., assignor to Bell & Howell Company, Chicago, Ill.

Filed Dec. 31, 1981, Ser. No. 336,470

Int. Cl.³ G03B *23/00*

U.S. Cl. 353—88 **15 Claims**



1. Apparatus for use with slide projector apparatus comprising:

a frame defining a slide projection station and a slide projection aperture being aligned with a predetermined optical projection path;

stationary guide means provided on said frame for generally aligning a slide received at said slide projection station;

a shutter member including a generally planar portion being pivotally mounted on said frame for movement between a first closed position blocking said optical projection path and a second open position not blocking said optical projection path, said shutter member including a shutter control arm extending generally perpendicularly from said generally planar portion in fixed relation thereto and being movable therewith;

a slide sensor arm being mounted with respect to said frame for shifting translation thereto, the direction of said shifting translation being generally in the direction defined by the width dimension of a slide received at said slide projection station, said slide sensor arm including a sensor portion extending from said slide sensor arm and into said slide projection aperture when said slide sensor arm is shifted to a first position, said slide sensor arm further including an extending tab portion forming a notch with said slide sensor arm for engaging said shutter control arm when said slide sensor arm is shifted to said first position and for releasing said shutter control arm when said slide sensor arm is shifted to a second position, said slide sensor arm with said sensor portion and said shutter control arm engaging portion comprising a generally elongated member, said sensor portion and said shutter control arm engaging portion extending from said slide sensor arm in the direction of shifting translation and being in fixed relation thereto and being movable therewith; and

slide sensor arm biasing means for biasing said slide sensor arm to said first position,

said slide sensor arm being shifted by said biasing means to said first position when no slide is present at said slide projection station to maintain said shutter member in said first closed position, said slide sensor arm not being shifted to said first position when a slide is present at said slide projection station so as to release said shutter member to said second open position, said shutter member being pivotable about an axis spaced apart from and in the same direction as said direction of shifting translation of said slide sensor arm, said shutter control arm being engaged by said tab portion of said shutter control arm engaging portion and being trapped below said shutter control arm engaging portion in said formed notch when said slide sensor arm is in said first position.

4,429,964

MIRROR-REFLEX CAMERA WITH ELECTRONIC RANGEFINDER

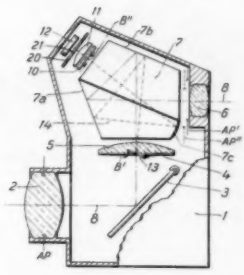
K. Dieter Schaefer, Braunfels, Fed. Rep. of Germany, assignor to Ernst Leitz Wetzlar GmbH, Wetzlar, Fed. Rep. of Germany

Filed Nov. 10, 1981, Ser. No. 320,075

Claims priority, application Fed. Rep. of Germany, Dec. 15, 1980, 3047184

Int. Cl.³ G03B *3/00*

U.S. Cl. 354—403 **3 Claims**



1. A mirror reflex camera comprising:

(a) a picture taking objective having a horizontal optical axis and an object image projected by said picture taking objective;

(b) a grating acting as a spatial frequency filter;

(c) an electronic rangefinder including a photoelectric detection system;

(d) a viewer system located along said optical axis comprising in series a focusing screen having a plane, a field lens, a pentaprism and an eyepiece, said optical axis being offset in parallel from its original path by two reflections in said pentaprism and exiting said eyepiece;

(e) mirror means comprising a fully specular concave mirror (7c) provided at the lower edge of the exit surface of said pentaprism (7) and having a focal plane; and

(f) means (13) defining a measuring spot in said plane for optically deflecting a first portion (14) and a second portion (8) of said object image; in the vicinity of said eyepiece (6) and in the vicinity of said concave mirror (7c), first and second mutually vertically offset and overlapping pupil images (AP′, AP″) are generated by said first and second portions, said first pupil image (AP′) being central with respect to said eyepiece (6) and generated by said second portion, while said second pupil image (AP″) is generated by said first portion.

4,429,965

PHOTOGRAPHIC CAMERA OF AUTOMATIC FOCUSSING TYPE

Shigeo Enomoto, Tokyo, and Mitsuhiko Shimoda, Asaka, both of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 218,491, Dec. 19, 1980, abandoned. This application Oct. 23, 1981, Ser. No. 314,487

Claims priority, application Japan, Dec. 27, 1979, 54-173826

Int. Cl.³ G03B *3/10*

U.S. Cl. 354—402 **10 Claims**

1. An interchangeable lens photographic camera of auto-

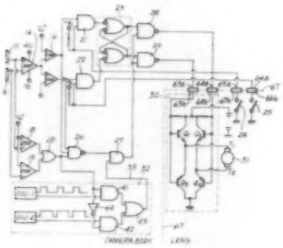
matic focussing type, capable of focussing objects, between a minimum and an infinite focussing distance comprising:

a camera body;

an interchangeable lens housing removably fitting in the camera body, said lens housi..g having a movable lens, a first switch for providing a signal associated with focussing an object at the infinite distance and a second switch for producing a signal associated with focussing an object at the minimum distance;

a reversible focussing motor located in the lens housing and coupled to the lens for moving the lens for focussing objects lying between the minimum and infinite distance;

electrical drive means located in the lens housing for driving the focussing motor responsive to two control signals indicating together the desired presence and direction of rotation of the focussing motor;



means in the camera body for generating two control signals indicating the presence and direction of rotation of the focussing motor;

first and second pairs of contacts, coupled between the lens housing and the camera body, for transmitting the respective two control signals from the camera body to the drive means in the lens housing; and

third and fourth pairs of contacts, coupled between the lens housing and the camera body, for transmitting the signals, produced by the first and second switchs, respectively, from the lens housing to the generating means in the camera body, said pairs of contacts being oriented on the lens housing relative to each other for providing signal coupling between the lens housing and the camera body.

4,429,966

CAMERA WITH PHOTOELECTRIC FOCUS DETECTING DEVICE

Kazuya Hosoe, Kunitachi; Takao Kinoshita, Tokyo, and Masayoshi Yamamichi, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 14, 1982, Ser. No. 368,433

Claims priority, application Japan, Apr. 16, 1981, 56-57451; Apr. 17, 1981, 56-58174; Apr. 17, 1981, 56-58175; Apr. 17, 1981, 56-58176

Int. Cl.³ G03B *3/00, 7/099, 15/05, 17/20*

U.S. Cl. 354—406 **26 Claims**

1. A camera comprising:

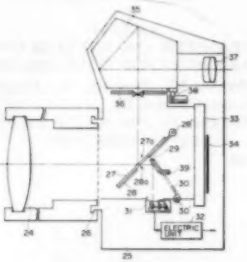
(A) a focus-adjustable objective lens;

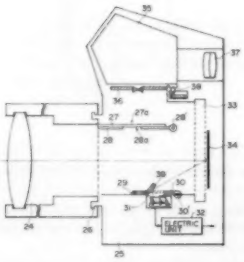
(B) means for exposing a photosensitive member to light from said objective lens;

(C) a system for detecting the focusing state of said objective lens, said system including means for converting light into an electric signal;

(D) optical means for directing the light reflected from said photosensitive member toward said converting means upon exposure of said photosensitive member to the light by said exposing means; and

(E) circuit means for producing an output associated with exposure of said photosensitive member in response to an





output of said converting means with respect to the light reflected from said photosensitive member.

4,429,967

DISTANCE MEASURING SYSTEM

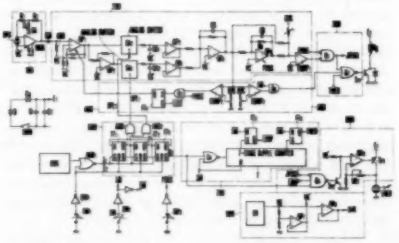
Ryuji Tokuda; Masahiko Ogawa, both of Tokyo; Tokuichi Tsunekawa, Kanagawa, and Shuichi Tamura, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Japan

Continuation of Ser. No. 33,334, Apr. 25, 1979, abandoned. This application Jun. 23, 1982, Ser. No. 391,394

Claims priority, application Japan, Apr. 28, 1978, 53-51856

Int. Cl.³ G03B *3/00;* **G01C** *3/10*

U.S. Cl. 354—403 **7 Claims**



1. A distance measuring system comprising:

(a) light sensitive means for converting light from an object whose distance is to be measured into an electrical signal;

(b) amplifying means connected to the output of said light sensitive means for amplifying the electrical signal;

(c) output means responsive to the amplified electrical signal and for producing an output signal corresponding to the distance to the object; and

(d) gain control means connected to the amplifying means for

making the gain of said amplifying means high when the level of the electrical signal from said light sensitive means is lower than a predetermined level prior to the initiation of the operation of said output means;

said output means including means for inhibiting the output signal until the gain control means completes the gain control operation.

4,429,968

AUTOMATIC FOCUS CONTROL DEVICE

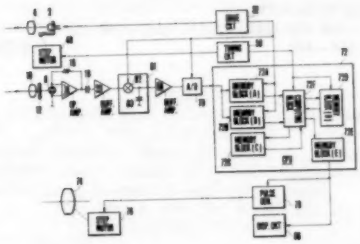
Hideo Taka, and Makoto Masunaga, both of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Japan

Filed Jul. 14, 1982, Ser. No. 398,183

Claims priority, application Japan, Jul. 22, 1981, 56-114852; Jul. 22, 1981, 56-114853

Int. Cl.³ G03B *3/10*

U.S. Cl. 354—403 **50 Claims**



1. A device comprising:

(A) means for projecting radiation toward an object;

(B) means for sensing the radiation reflected by and coming from the object and for producing an electrical output indicative of the intensity of the received radiation;

(C) means for effecting relative movement between the reflected radiation and said sensing means;

(D) means for processing the electrical output of said sensing means to produce an output related to an object range; and

(E) means arranged between said effecting means and said processing means for relating the output processing operation of the processing means to said relative movement between the radiation and said sensing means effected by the effecting means.

4,429,969

EXPOSURE CONTROL DEVICE OF CAMERA FOR FLASH EXPOSURE

Takashi Saegusa, Sagamihara, Japan, assignor to Nippon Kogaku K. K., Tokyo, Japan

Filed Apr. 6, 1982, Ser. No. 366,073

Claims priority, application Japan, Apr. 10, 1981, 56-53131; Apr. 10, 1981, 56-53132; Apr. 10, 1981, 56-53133

Int. Cl.³ G03B *7/081, 7/28, 15/05*

U.S. Cl. 354—414 **19 Claims**

1 An exposure control device for photographing an object field to be illuminated by a flash unit, comprising:

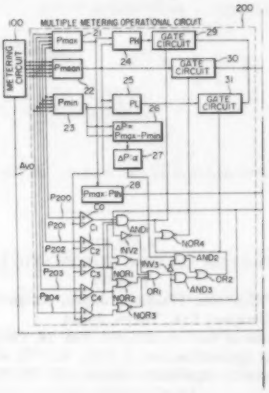
(a) means for measuring luminances in plural areas divided in said object field and generating electric output signals corresponding to the luminances in said areas;

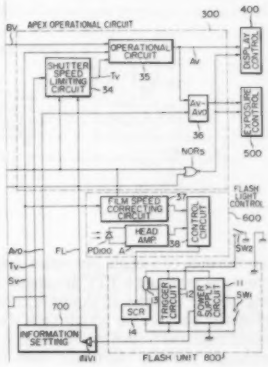
(b) first comparator means for extracting maximum and minimum output signals from said electric output signals, comparing the difference of said maximum and minimum output signals with a reference value and generating an output signal in case said difference is smaller than said reference signal;

(c) means for releasing an output signal upon detection in advance that a flash is to be given by said flash unit at said photographing;

(d) second comparator means for comparing the luminance measured in said object field with a determined value and generating an output signal in case said luminance is substantially larger than said determined value;

(e) means for forming a light-metering output signal from said electric output signals, said means comprising means for producing a first light-metering output signal





upon the simultaneous reception of the output signals from said first comparator means and said flash detecting means for giving an appropriate exposure to the areas of relatively low luminances in said plural areas; and

(f) means for controlling the exposure in accordance with said first light-metering output signal in response to the output signal from said second comparator means.

4,429,970

ILLUMINATING LIGHT AMOUNT CONTROLLABLE RETINAL CAMERA

Hiroshi Fujiwara, Kawasaki, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Apr. 27, 1982, Ser. No. 372,375

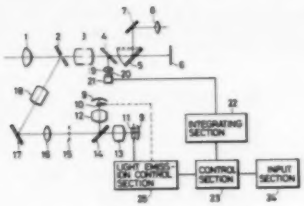
Claims priority, application Japan, Apr. 28, 1981, 56-65073

Int. Cl.³ A61B *3/14;* G03B *7/16, 29/00*

U.S. Cl. 354—413 **5 Claims**

1. A retinal camera comprising a light receiving element which can receive a part of the light from the retina and an illuminating light source which is arranged to illuminate said retina and can have the emitted light amount controlled on the

basis of the light amount detected by said light receiving element, the light measuring range of said retina being made at



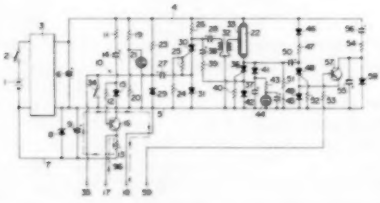
least 2.5 times as large in the diameter as the nipple of the retina.

4,429,971

APPARATUS FOR TESTING AUTOMATIC ELECTRONIC FLASH

Kazunori Mizokami, Hachioji, Japan, assignor to Olympus Optical Company Ltd., Tokyo, Japan

Continuation of Ser. No. 235,702, Feb. 18, 1981, abandoned. This application Jan. 3, 1983, Ser. No. 455,300
Claims priority, application Japan, Apr. 23, 1980, 55-54785
Int. Cl.³ G03B *15/05*
U.S. Cl. 354—415 **12 Claims**



1. In a combination of a single lens reflex camera of the TTL direct photometry type and a TTL automatic electronic flash, in which the camera includes an exposure control circuit having a photometric element on which light passing through a taking lens and reflected from a shutter blind surface and a film surface impinges, and the electronic flash includes a flash discharge tube, the emission of light therefrom being interrupted in response to an illumination control signal which is produced by the exposure control circuit; an apparatus for testing the automatic electronic flash comprising:

a test switch in said electronic flash connected in parallel with a synchro contact switch contained within the camera for use during actual flash photography operations, said test switch for initiating the emission of flashlight upon being closed to test the emission of flashlight from the flash discharge tube without a shutter operation;

said exposure control circuit including said photometric element for receiving light during testing of said electronic flash and during actual flash photography, said photometric element operating to receive said emitted flashlight when said test switch is closed;

means for detecting the emission of flashlight from the flash discharge tube as it is activated in response to the closure of the test switch and for producing a light emission signal;

means in said camera for receiving said light emission signal and applying same to said exposure control circuit;

said exposure control circuit including a trigger switch and means for operating said trigger switch to activate said exposure control circuit in response to receiving said light emission signal from said receiving means; and

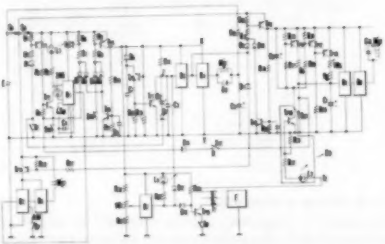
said activated exposure control circuit including means for providing an integrated voltage in accordance with the amount of light received by said photometric element during said test operation.

4,429,972

SINGLE LENS REFLEX CAMERA HAVING AN ELECTRO-MAGNETIC DEVICE

Masayoshi Yamamichi; Yukio Iura, both of Kanagawa; Hiroshi Aizawa, Tokyo; Tadashi Ito, Kanagawa; Tetsuya Taguchi, Kanagawa, and Tadanori Uchidoi, Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 973,890, Dec. 28, 1978, abandoned, which is a continuation of Ser. No. 678,207, Apr. 19, 1976, abandoned, which is a continuation of Ser. No. 545,322, Jan. 29, 1975, abandoned. This application Feb. 4, 1981, Ser. No. 231,032
Claims priority, application Japan, Feb. 4, 1974, 49-14360; Jul. 27, 1974, 49-86370
Int. Cl.³ G03B *7/085, 7/26, 17/38, 19/12*
U.S. Cl. 354—448 **6 Claims**



1. An electro-magnetic control system for a camera, comprising:

diaphragm control means;

mirror driving means;

driving power means for driving said diaphragm control means and said mirror driving means, the driving power means having a driving spring means to be charged for producing power for driving said control means and said mirror driving means;

initiation means arranged to hold said diaphragm control means and said mirror driving means in a charged state thereof and then to be movable for releasing said diaphragm control means and mirror driving means from the charged state to an actuating state;

electro-magnetic release means for operating said initiation means, said electro-magnetic release means being provided with an electro-magnet equipped with a permanent magnet, the magnetic flux of which causes said electromagnet to attract an armature interlocked with said initiation means, said electro-magnetic release means being arranged such that, when the excitation coil thereof is energized, said magnetic flux of said permanent magnet is offset by a magnetic flux produced by the excitation coil to release said armature from the attraction by said electro-magnet, said armature having biasing means for applying a given force thereto sufficient to release said initiation means into an actuating state;

a power source;

current supplying means connected to said power source to supply an electric current to said excitation coil, said current supplying means having a capacitor which is charged with a current supplied from said power source and a resistor which restricts the capacitor charging current, said capacitor being provided with a discharge route to which said excitation coil is connected, said current supplying means being provided with electronic switch-

ing means for adding a driving pulse to the excitation coil from the capacitor;

current supply control means which controls the energization of said excitation coil effected by a discharging operation of said capacitor, said current supply control means being provided with control circuit means connected with said electronic switching means for turning on the latter during a predetermined period;

switch means having a first switch and a second switch, said second switch controlling the operation of said current supply control means, and being arranged to be turned on to actuate said current supply control means for energizing said excitation coil by allowing said capacitor to perform said discharging operation, said switch means having delay means for generating an operation signal to control the operation of said current supply control means a predetermined time after said switch means becomes on; and

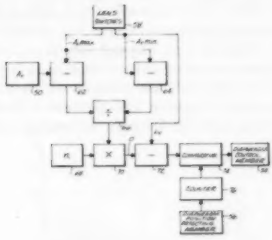
releasing operation means for turning on the first switch by a stroke and turning on the second switch by a second stroke.

4,429,973

COMPENSATION FOR DIAPHRAGM CONTROL FOR SLR CAMERA

Masahiro Kawasaki, Tokyo; Fumio Urano, Omiya, and Yasumasa Tomori, Sakado, all of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 8, 1982, Ser. No. 355,767
Int. Cl.³ G03B *7/095, 7/20*
U.S. Cl. 354—455 **6 Claims**



1. A camera comprising:

a displaceable actuator;

a diaphragm adjustable between a maximum aperture value and a minimum aperture value responsive to displacement of the actuator;

means for generating a first signal representative of the displacement of the actuator;

means for generating a second signal representative of the desired aperture value of the diaphragm for correct exposure, the second signal equaling the desired aperture value minus the maximum aperture value;

means for generating a third signal representative of the difference between the minimum aperture value and the maximum aperture value;

means for displacing the actuator upon shutter release to adjust the diaphragm; and

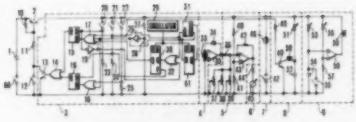
means responsive to the first, second, and third signals for arresting the displacement of the actuator when the diaphragm is adjusted to the desired aperture value, the arresting means comprising means for dividing the second signal by the third signal to derive a fourth signal, means for comparing the fourth signal with the first signal, a diaphragm control magnet that arrests displacement of the actuator responsive to a binary signal of a given value, and means responsive to the comparing means for applying to the control magnet a binary signal of the given value when the fourth signal and the first signal assume a predetermined relationship.

4,429,974

POWER SUPPLY DEVICE FOR CAMERA

Nobuyuki Suzuki, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 24, 1982, Ser. No. 391,718
Claims priority, application Japan, Jul. 7, 1981, 56-106406
Int. Cl.³ G03B *7/087, 17/38*
U.S. Cl. 354—484 **7 Claims**



1. A camera comprising:

(a) a release operation member;

(b) a camera circuit including at least a light measuring circuit;

(c) a power supply circuit forming a power supply path to the camera circuit;

(d) a timer circuit arranged to keep the power supply circuit in an operative state for a prescribed time counting period; and

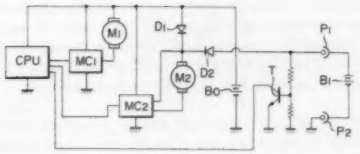
(e) a control circuit arranged to cause the timer circuit to be operative when said release operation member stays in an operative state for a length of time longer than a prescribed length of time.

4,429,975

CONTROL CIRCUIT FOR CAMERAS HAVING INTERNAL AND EXTERNAL POWER SUPPLIES

Kazuo Shiozawa, and Hideaki Sakai, both of Hachioji, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed May 19, 1982, Ser. No. 379,757
Claims priority, application Japan, May 28, 1981, 56-80056
Int. Cl.³ G03B *17/00*; **H02J** *1/00*
U.S. Cl. 354—202 **3 Claims**



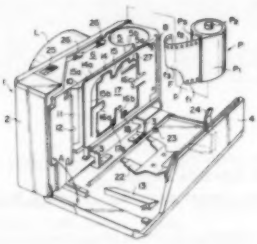
1. In a camera of the type in which a plurality of operable elements are operated by a source of power contained therein, the improvement comprising means controlling certain of said elements for sequential operation when connected to said contained source of power, an external source of power, means connecting said external source of power to said operable elements and means responsive to implementation of said connecting means for controlling said certain elements for parallel operation.

4,429,976

EASY LOADING CAMERA

Jiro Sekine; Hiroshi Komatsuzaki; Hiroshi Hara, and Nobuyuki Kameyama, all of Tokyo, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 18, 1982, Ser. No. 434,931
Claims priority, application Japan, Oct. 20, 1981, 56-167561
Int. Cl.³ G03B 17/28
U.S. Cl. 354—203 3 Claims



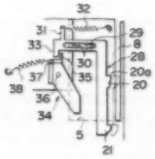
1. A photographic camera comprising a film magazine receiving chamber formed in the camera body on one side of a film aperture and shaped to permit insertion of a film magazine having a film leader into the receiving chamber in one axial direction of the film magazine, and a film leader guiding means for guiding the film leader in between the film aperture and a pressure plate from one longitudinal edge thereof when the magazine is inserted into the chamber, characterized in that a first edge limiting member is provided in the camera body to abut against said one longitudinal edge of the film leader to limit its position in the transverse direction thereof, and a second edge limiting member is mounted on a back lid of the camera body so as to abut against the other longitudinal edge of the film leader to limit its position in the transverse direction thereof when the back lid is closed.

4,429,977

EASY LOADING CAMERA

Jiro Sekine; Hiroshi Komatsuzaki; Hiroshi Hara, and Nobuyuki Kameyama, all of Tokyo, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 18, 1982, Ser. No. 434,932
Claims priority, application Japan, Oct. 20, 1981, 56-167560
Int. Cl.³ G03B 17/22, 17/28
U.S. Cl. 354—203 6 Claims



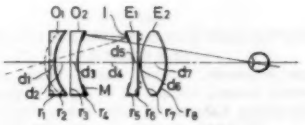
1. A photographic camera comprising a film magazine receiving chamber shaped to permit insertion of a film magazine having a film leader thereinto in one axial direction of the film magazine, and a film leader guiding means for guiding the film leader to extend in a proper direction when the magazine is inserted into the chamber characterized by having a tongue portion position limiting means for limiting the position of a narrow tongue portion formed in the leading end portion of the film, the tongue portion position limiting means comprising a tongue portion position limiting member which is movable between a retracted position in which it is retracted from the feeding path of the film and an operative position in which it projects into the feeding path to limit the position of the narrow tongue portion, and a control means which permits the tongue portion position limiting member to move to the operative position only when a film magazine from which only the narrow tongue portion projects as the film leader is inserted into the film magazine receiving chamber, said tongue portion position limiting member being adapted to be moved to the retracted position when the back lid of the camera is closed.

4,429,978

ALBADA FINDER

Kazuo Ikari, Hachiouji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Apr. 6, 1982, Ser. No. 366,088
Claims priority, application Japan, Apr. 9, 1981, 56-53602
Int. Cl.³ G03B 13/08
U.S. Cl. 354—224 25 Claims



1. An albada finder comprising a first negative lens element, a second negative lens element having a part thereof any one of a reflecting surface and semi-transmission surface both used to form an image of a field mask, a third lens element and a positive eyepiece element, said first and second negative lens elements forming an objective, and said field mask being provided on the surface of said third lens element which is faced to any one of said second negative lens element and said positive eyepiece element, and satisfying the following conditions:

$$0.5 < |r_7/r_8| < 10$$

$$r_7 > 0$$

$$r_8 < 0$$

wherein the reference symbols r_7 and r_8 represent radii of curvature of the respective surfaces of the positive eyepiece element.

4,429,979

PHOTOGRAPHING DATA INDICATOR FOR A SINGLE LENS REFLEX CAMERA

Katumi Terada, Hachioji, Japan, assignor to Olympus Optical Company Ltd., Japan

Filed Feb. 5, 1982, Ser. No. 346,125
Claims priority, application Japan, Mar. 13, 1981, 56-36110[U]
Int. Cl.³ G03B 17/20
U.S. Cl. 354—289.1 8 Claims

1. Photographing data indicator for single lens reflex camera, comprising:

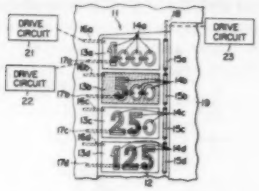
a first drive electrode having a through opening formed therein, the configuration of which represents photographing data;

a second drive electrode having a solid configuration which represents photographing data and which is disposed inside the through opening formed in the first drive electrode;

the first and second drive electrodes being disposed on a liquid crystal display panel which is in turn disposed within a viewfinder of a camera; and

a drive means for operating said data indicator in a first

mode wherein only said first drive electrode is visible, a second mode wherein only said second drive electrode is visible, and a third mode wherein both said first and sec-



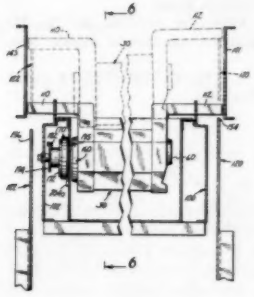
ond drive electrodes, as well as the portion of said liquid crystal display panel adjacent said electrodes, are invisible whereby said data indicator is totally transparent when operated in said third mode.

4,429,980

MAGNETIC DRIVE MECHANISM FOR FILM DISC PROCESSOR

Clare K. Miller, Golden Valley, Minn., assignor to Pako Corporation, Minneapolis, Minn.

Filed Oct. 5, 1982, Ser. No. 432,817
Int. Cl.[3] G03B 3/04, 3/08
U.S. Cl. 354—311 15 Claims



1. A processor for processing undeveloped photographic film discs, the processor comprising:

a rotatable spindle for carrying film discs;

a follower magnet connected to the spindle adjacent one end thereof;

conveyor means for conveying the spindle intermittently along a generally horizontal conveyor path to each of a plurality of stations so that the spindle has an axial direction which is generally horizontal and perpendicular to the conveyor path;

a drive magnet rotatably mounted adjacent selected stations in spaced axial alignment with the follower magnet when the spindle is positioned at one of the selected stations; and

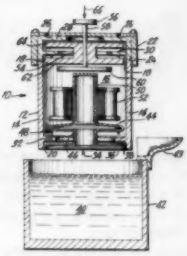
drive magnet rotation means for rotating the drive magnet to cause the follower magnet, spindle and film discs mounted thereon to be rotated due to magnetic coupling of the drive magnet and the follower magnet.

4,429,981

TANK APPARATUS WITH FLOATING AGITATOR FOR PROCESSING PHOTOGRAPHIC FILM

William J. Frazier, 4739 Lighthouse Rd., Orlando, Fla. 32808

Filed Sep. 28, 1982, Ser. No. 425,660
Int. Cl.[3] G03B 3/04
U.S. Cl. 354—316 6 Claims



1. A tank apparatus for use in processing photographic material, such apparatus being adapted, during such processing, to be submerged by moving said apparatus in a vertical direction downwardly into one or more vessels containing a chemical solution used to process such film comprising, in combination,

(a) container means for housing the photographic material during such processing, said container means having at least one opening for receiving a chemical solution in the interior portion thereof to contact the photographic material housed therein, said opening being positioned at that portion of said container means which is first placed in a chemical solution held in a vessel;

(b) floating agitator means operatively positioned within said container means and effective to carry said photographic material during processing, said agitator means being positioned to reciprocally move between a first position and a second position within said container upon the application of a force said first position being located adjacent said opening in said container means and said second position being located vertically and linearly displaced from said first position;

(c) limiting means operatively connected to said container means and effective to limit the movement of said agitator means between said first and second positions, whereby the movement of said agitator means is substantially limited within a vertical plane essentially parallel to the direction followed when submerging said container means into a vessel;

(d) force activating means operatively connected to said agitator means and effective when actuated to move said agitator means between said first and second positions thereby moving said photographic material within said chemical solution contained within said container means said agitator means being unattached to said container means and to said force activating means, thereby being freely floating within said container means when filled with a chemical solution, whereby said photographic material may be reciprocally moved by activation of said floating means or by vertical movement of said container means in said solution.

4,429,982
APPARATUS AND METHOD FOR PROCESSING STABILIZATION PHOTOGRAPHIC PAPER

Peter V. Martino, Rego Park, and Peter Meyers, New York, both of N.Y., assignors to Pluribus Products, Inc., Brooklyn, N.Y.

Filed Apr. 8, 1982, Ser. No. 366,696
Int. Cl.³ G03D *5/06*
U.S. Cl. 354—318 **14 Claims**

1. A stabilization processor for developing stabilization paper, and stabilization processor comprising:

(a) a multi-bath assembly including a bottom surface, opposed parallel upstanding side walls and a plurality of upstanding dividers affixed perpendicular to said side walls and defining in turn,

an activator bath for storing activator solution to activate developing agents in said stabilization paper for developing prints on said stabilization paper,

a stop bath for storing a neutralizing solution for neutralizing said activator solution,

a stabilizer bath for storing stabilizer solution to halt development of said stabilization paper,

a rinse bath for storing a rinse solution, said rinse bath being disposed adjacent the stabilizer bath in said multi-bath assembly;

(b) a plurality of parallel pairs of rollers, each said pair of rollers comprising a parallel arrangement of an upper roller and a lower roller, said pairs of rollers extending between and rotatably mounted on said multi-bath assembly side walls, said upper and lower rollers of said plurality of pairs of rollers defining respectively upper and lower planes disposed parallel to said bottom surface, at least one pair of rollers being disposed in each said activator, stop, stabilizer and rinse bath, said lower rollers further being disposed such that at least a portion of each said lower roller is immersed in said activator, neutralizer, stabilizer or rinse solutions when said solutions are placed in said multi-bath assembly, and wherein the lower roller in each said pair of rollers is suspended from the upper roller in said pair of rollers by end bands, said end bands defining biasing loops mounted over both said upper and lower rollers in each said pair of rollers, to bais said rollers in each pair together; and

(c) a roller driving mechanism for causing rotation of at least one roller in each said pair of rollers.

4,429,983
DEVELOPING APPARATUS FOR EXPOSED PHOTORESIST COATED WAFERS

Charles A. Cortellino, Wappingers Falls; Joseph E. Levine, Poughkeepsie, and Henry C. Schick, Hopewell Junction, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 22, 1982, Ser. No. 360,157
Int. Cl.³ G03D *3/04, 3/06*
U.S. Cl. 354—320 **10 Claims**

1. Developing apparatus comprising:

a tank having an opening at the top thereof and having a substantial fluid tight gland in the bottom thereof,

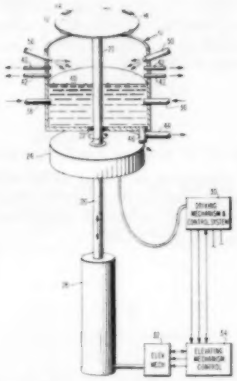
an elongated shaft movably mounted in said gland for vertical and rotational movement therein,

a driving mechanism coupled to said shaft for producing said rotational movement thereof,

an elevating mechanism coupled to said shaft for producing said vertical movement thereof,

a platform arranged on the upper end of said shaft,

a control system coupled to said elevating mechanism for raising said platform to a rest position above said tank for

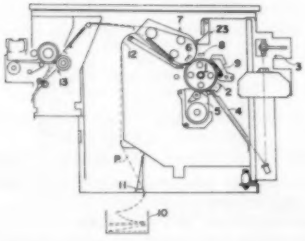


loading said platform, for lowering said platform into said tank to a given depth, for oscillating said platform between said given depth and a predetermined depth above said given depth, and for again raising said platform to said rest position for unloading said platform in readiness for subsequent reloading thereof.

4,429,984
COPYING MACHINE WITH TRACTION FEED

Akira Kiba, Toyokawa, and Kazuo Sugimoto, Moriyama, both of Japan, assignors to Minota Camera Kabushiki Kaisha, Osaka, Japan

Filed Mar. 11, 1982, Ser. No. 357,315
Claims priority, application Japan, Mar. 18, 1981, 56-38833[U]
Int. Cl.³ G03G *15/14, 21/00*
U.S. Cl. 355—3 SH **8 Claims**



5. A copying machine comprising a photosensitive member on which a toner image is formed, a traction device for transporting a continuous sheet of paper having perforated edges from a storage means to a fixing station through an image transfer region between said traction device and said photosensitive member, said traction device having an endless belt with projections at the opposite edges thereof engageable with the perforations of the sheet, and a transfer member therein for transferring the toner image from the photosensitive member to the transporting sheet, said traction device being shiftably mounted for movement between an operative position close to the photosensitive member and an inoperative position spaced from the operative position; and a plate-like member posi-

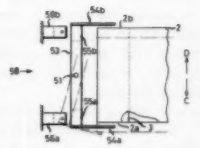
tioned along and immediately below said traction device when said traction device is in its operative position for receiving particles of paper released from said traction device to prevent the particles from getting into other components and movable to a position between said traction device and the photosensitive member when the traction device is shifted to its inoperative position for holding the leading edge of the sheet for initial setting of the sheet on the traction device and also for protecting the photosensitive member.

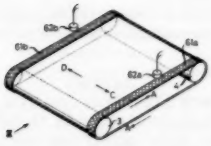
4,429,985

RECORDING SYSTEM PROVIDED WITH A DEVICE FOR CORRECTING DEVIATION OF RECORDING MEMBER IN ENDLESS BELT FORM

Takashi Yokota, Tokyo, Japan, assignor to Ricoh Company, Ltd., Japan

Filed Feb. 16, 1982, Ser. No. 349,301
Claims priority, application Japan, Feb. 20, 1981, 56-22909; Feb. 23, 1981, 56-25269; Feb. 23, 1981, 56-25721
Int. Cl.³ G03G *15/00*
U.S. Cl. 355—3 BE **12 Claims**





1. A recording system comprising a recording member in the form of an endless belt supported and driven for movement by a plurality of rollers for recording information on said recording member, comprising a device for correcting deviation of the endless belt recording member comprising:

deviation sensing means for sensing movement of said endless belt recording member in a direction at right angles to the direction of movement of the recording member and generating a signal; said deviation sensing means comprising at least one reflection type light sensor arranged in the vicinity of and juxtaposed against at least one side peripheral portion of said endles belt recording member, and a sensed pattern movable into a sensing zone of said reflection type light sensor when said recording member moves in a direction at right angles to the direction of its movement, said sensed pattern having a light reflection factor distinct from the light reflection factor of said recording member;

deviation correcting means for correcting the deviation of said recording member; and

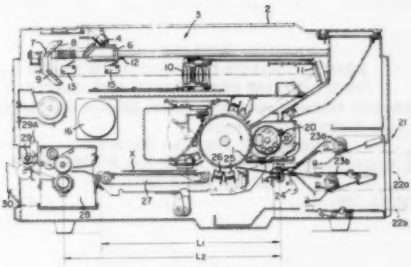
a control circuit receiving said signal generated by said deviation sensing means and actuating said deviation correcting means based on said signal.

4,429,986

CONTROL METHOD OF ELECTROPHOTOGRAPHIC COPYING MACHINE

Shunichi Abe, and Mitsuo Akiyama, both of Hachioji, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Aug. 5, 1981, Ser. No. 290,394
Claims priority, application Japan, Aug. 20, 1980, 55-113481
Int. Cl.³ G03G *15/28*
U.S. Cl. 355—8 **3 Claims**



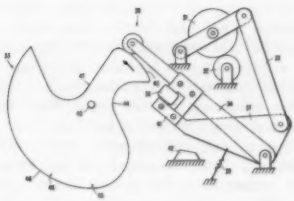
1. In a method of electrophotographic copying utilizing a slit exposure optical system of the type equipped with a reciprocating primary movable carriage and a reciprocating secondary movable carriage having a speed of one half the primary movable carriage for scanning an original and directing the scanned image onto a photosensitive drum, means developing the image formed on said drum, and means moving a transfer medium from a position at one side of the drum, beneath said drum to transfer the image from the drum onto the transfer medium, and thence into a device where the transferred image is fixed upon the transfer medium, the improvement comprising prohibiting return movement of the reciprocating carriages from the time the leading edge of the transfer medium is at a position immediately in front of the fixing device, until it is fully discharged therefrom.

4,429,987

EARLY FUSER ROLL CLOSURE WITH REDUCED FORCE

Jack P. Chang, and Marc L. Steinbrecher, both of Boulder, Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 16, 1982, Ser. No. 348,886
Int. Cl.³ G03G *15/20*
U.S. Cl. 355—14 FU **20 Claims**



1. A xerographic toner fixing apparatus comprising:

substantially parallel first and second cylindrical fuser rollers;

biasing means for maintaining the peripheral surfaces of said fuser rollers in an open position;

a rotatable cam with at least a first high dwell and a second high dwell;

a linkage mechanism coupling said cam to at least one of said fuser rollers; and

means for rotating said cam whereby the peripheral surfaces of said fuser rollers are shifted between open and closed positions in accordance with the contour of said cam and the closing force exerted between said fuser rollers during said first high dwell is less than the closing force exerted between said fuser rollers during said second high dwell.

4,429,988

PRINTED PAPER FEEDING DEVICE FOR PHOTOGRAPH PROCESSING APPARATUS

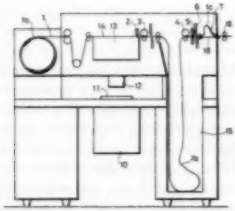
Katsuhiko Okabe, Tokorozawa, Japan, assignor to Copal Company Limited, Tokyo, Japan

Filed Jan. 5, 1982, Ser. No. 337,245

Claims priority, application Japan, Jan. 9, 1981, 56-2451

Int. Cl.³ G03B *29/00*

U.S. Cl. 355—28 **4 Claims**



1. A print paper feeding device for photograph processing apparatus comprising a cut marker which can make a cut mark between two adjacent picture frames of a tape-shaped print paper simultaneously with printing it, a first roller means which can intermittently feed said print paper by a length corresponding to one picture frame, a stocker which is set in the rear of said first feeding roller and can contain said print paper portion fed out of said first feeding roller means, a second feeding roller means which is arranged in the rear of said stocker and is to pull said print paper within said stocker out of said stocker, a cut mark senser which is set in the rear of said second feeding roller means and can detect said cut mark and issue a signal to stop said second feeding roller means whenever a length portion corresponding to one picture frame of said print paper is fed, a cutter which is set in the rear of said cut mark senser and can cut the print paper in the position of said cut mark, a third feeding roller means which is arranged in the rear of said cutter and is rotated at a velocity lower than of said second feeding roller means to form a loop of said print paper between it and said cutter, a loop senser which is arranged between said cutter and third feeding roller means and can issue a signal to start said second feeding roller means when said loop becomes smaller than a predetermined size, and a controller which can receive signals from said cut mark senser and loop senser to control the respective operations of said cut marker, first feeding roller means, second feeding roller means and cutter; the size of said loop being maintained between a predetermined lower limit and an upper limit obtained by adding a length corresponding to one picture frame portion to said lower limit by said loop senser; and said print paper being cut in the position of said cut mark by said cutter when the number of said cut marks of the print paper portion which has been fed into a processor by said third feeding roller means attains a predetermined value and said second feeding roller means is stopped.

4,429,989

APPARATUS FOR PRESSING ORIGINAL

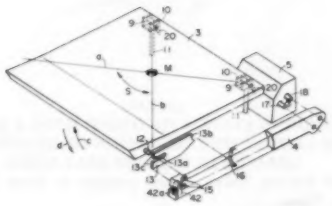
Shigeru Yoshimura, Yokohama; Kiyomichi Ichikama, Kawasaki, and Noriyoshi Ueda, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 195,430, Oct. 9, 1980, abandoned. This application Sep. 3, 1982, Ser. No. 414,885

Claims priority, application Japan, Oct. 13, 1979, 54-132078; Oct. 13, 1979, 54-132079; Oct. 13, 1979, 54-132080; Oct. 29, 1979, 54-150372

Int. Cl.³ G03B *27/62*

U.S. Cl. 355—76 **7 Claims**



1. A device for automatically opening and closing an original pressing member for pressing an original against an original supporting surface, said device comprising:

an original pressing member having a rotating center freely slidably perpendicular of the original supporting surface about which center the pressing member is pivotable relative to the original supporting surface;

a rotatable driving shaft provided independently from said rotating center for automatically closing and opening said original pressure member;

a supporting arm engaging with said driving shaft for receiving the drive from said driving shaft so as to be rotated, said supporting arm being movably engaged with said original pressing member;

motor means; and

connecting means to transmit the driving force of said motor means to said rotatable driving shaft.

4,429,990

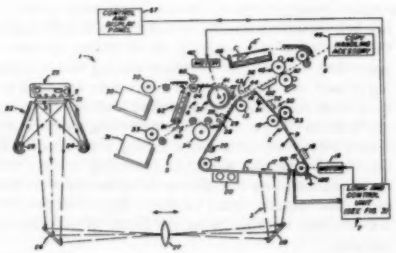
APPARATUS FOR CONTROLLING THE APPLICATION OF FUSER RELEASE MATERIAL IN ROLLER FUSERS

Ernest J. Tamary, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 26, 1982, Ser. No. 362,436

Int. Cl.³ G03G *15/00*

U.S. Cl. 355—14 FU **8 Claims**



1. In reproduction apparatus including means for forming fixable images on one or both sides of a series of copy sheets constituting a copy run, first and second fuser rollers forming a nip through which said copy sheets are passed to fix the

images to the copy sheets, and actuable means for applying, when actuated, fuser release material to at least one of said rollers, the improvement comprising:

first means for detecting fixable images formed during a copy run of said reproduction apparatus;

second means for detecting copy sheets exiting from the nip of said fuser rollers; and

control means (1) for counting the number of fixable images detected by said first detecting means after the start of a copy run, (2) for counting the number of copy sheets detected by said second detecting means after the start of a copy run, and (3) for actuating said means for applying when said count of fixable images and said count of copy sheets have a preselected numerical relationship which provides an optimal application of release material per copy sheet and for deactuating said means for applying to discontinue the applying of fuser release material when said count of fixable images and said count of copy sheets do not have said preselected numerical relationship.

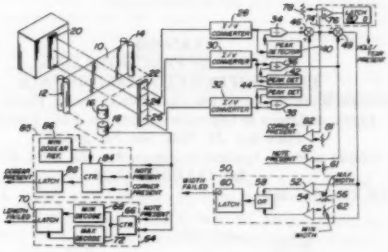
4,429,991
METHOD FOR DETECTING PHYSICAL ANOMALIES OF U.S. CURRENCY

Charles J. Williams, Carmel, N.Y., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Aug. 17, 1981, Ser. No. 293,067

Int. Cl.³ G01N *21/17*; G01B *11/04*

U.S. Cl. 356—73 **5 Claims**



1. A system for examining and detecting anomalies in bills comprising:

a source of light;

light detector means comprising at least first, second and third light detectors aligned to detect light from said source of light above, through and below said bill, respectively, and to generate electrical signals corresponding with the amount of light received from said source;

means for transporting one of said bills between said light source and said light detector means to control the amount of light reaching said detector;

first, second and third peak level detector circuits to respond to electrical signals from said first, second and third detectors to produce and maintain peak output signals representative of the peak output signal levels from said first, second and third detectors when no bill is present between said source of light and said detectors,

first, second and third divider circuits for receiving the electrical signals from said first, second and third detectors and the peak output signals from said first, second and third peak detector circuits to produce divided output signals therefrom,

an adder circuit for receiving the divided output signals from said first and third divider circuits to provide an added output signal representing the sum of the signals received from said first and third detectors,

a subtractor circuit for receiving the divided output signal from said second divider circuit and the added output signal from said adder circuit to produce a subtracted output signal representing the actual width of the bill.

4,429,992
METHOD AND DEVICE FOR TESTING OPTICAL IMAGING SYSTEMS

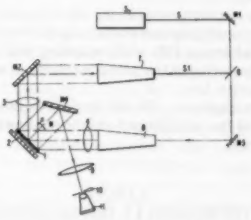
Gerd Häusler, Erlangen; Walter Jürisch, Boeblingen, and Günter Makosch, Sindelfingen, all of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 22, 1981, Ser. No. 266,243

Claims priority, application Fed. Rep. of Germany, May 24, 1980, 3020022

Int. Cl.³ G01M *11/00*; G01B *9/02, 11/14*; H01L *21/66*

U.S. Cl. 356—124 **18 Claims**



1. A method for testing an optical imaging system where an original pattern is compared with a pattern copy made by the imaging system to be tested, including the steps of

generating a first interferogram of said original pattern by two light beams symmetrically impinging and overlapping on said original pattern,

making a pattern copy of said original pattern using said imaging system to be tested,

generating a second interferogram of said pattern copy under conditions identical to those used to generate said first interferogram, and

comparing said first and second interferogram to determine the relative deviations between said first and second interferograms said deviations being a measure of the quality of said optical imaging system.

4,429,993
METHOD AND APPARATUS FOR TESTING THE CORRESPONDENCE OF LINE OF SIGHT WITH TARGET LINE

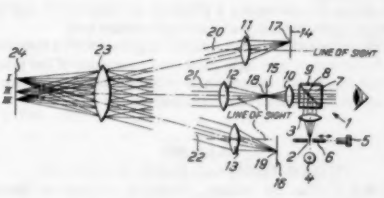
Dieter Schick, Solms, Fed. Rep. of Germany, assignor to Ernst Leitz Wetzlar GmbH, Wetzlar, Fed. Rep. of Germany

Filed Oct. 30, 1981, Ser. No. 316,953

Claims priority, application Fed. Rep. of Germany, Nov. 25, 1981, 3044554

Int. Cl.³ G01B *11/26*; G01C *1/00*

U.S. Cl. 356—152 **15 Claims**



1. An apparatus for testing the correspondence of at least one line of sight of an optical instrument with at least one target line of a weapon, comprising:

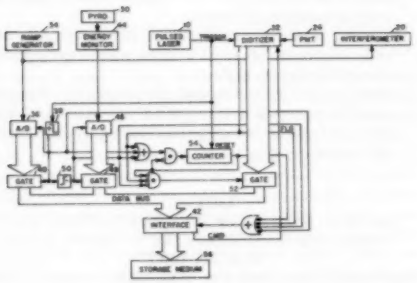
(a) an imaging system (23) said imaging system having a beam path and an image plane (24), a given area of said image plane defining a measuring field (25);

(b) a photoelectric, line-type sensor (26) mounted in said image plane (24) of said imaging system (23);
(c) optical means (1) projecting light dots (I, II, III) corresponding to said line of sight and said target line into said measuring field (25);
(d) means (27) for generating a linear relative motion between said measuring field (25) and said sensor (26) for scanning said light dots (I, II, III) in said measuring field (25) by said sensor (26);
(e) means (37, 44) for storing signals representing in coordinates the nominal positions of said line of sight and said target line with respect to each other and for simultaneously determining one of said positions as the origin of a coordinate system;
(f) electronic circuit means (31, 32, 53, 54) including said means (37, 44) for analyzing and evaluating electrical signals generated by said sensor (26) while scanning and light-dots (I, II, III) representative of the actual positions of said line of sight and said target line; and
(g) means for displaying (39, 46) deviations of said actual positions of said line of sight and said target line from said nominal positions.

4,429,994
SYSTEM FOR REMOTELY DETERMINING VELOCITY OF SOUND IN WATER

John L. Guagliardo, Lynnfield, Mass., and Harold L. Dufilho, Carriere, Miss., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 22, 1980, Ser. No. 219,291
Int. Cl.³ G01P *3/36*; G01B *9/02*
U.S. Cl. 356—28.5 11 Claims



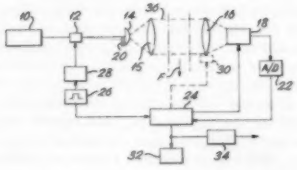
1. A remote sensing instrument comprising:
(a) means for transmitting pulses of light into a medium;
(b) means for collecting Brillouin scattered light from said medium;
(c) means for analyzing said scattered light over a frequency spectrum;
(d) means for obtaining a plurality of samples of said scattered light for each of said light pulses; and
(e) means for storing said samples together with a measure of the power of said light pulse and a measure of the point in said frequency spectrum at which said samples are obtained for each of said light pulses.

4,429,995
TWO DIMENSINAL FLOW ANALYZER

Apostolos Goulas, St. Albans, England, assignor to National Research Development Corporation, London, England

Filed Jul. 16, 1981, Ser. No. 283,915
Claims priority, application United Kingdom, Jul. 21, 1980, 8023848
Int. Cl.³ G01P *05/20*; G01N *21/49*
U.S. Cl. 356—343 6 Claims

1. Apparatus for analysing flowing fluid which contains light-scattering particles comprising a light source; beam-expansion means to expand a light beam from the source to provide a two-dimensional planar sheet of light, there being at least a component of the fluid flow in the plane of said sheet; camera sensing means having light receiving means in the form of a two-dimensional matrix to sense light scattered by the particles; switch means arranged to allow intermittent illumination of the flowing fluid so that the sensing means senses scattered light only intermittently; and calculating means to

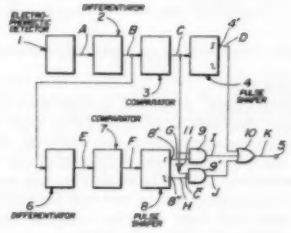


calculate from the intermittently-sensed light a property of the flow; said apparatus further including a focusing lens between the sheet of light and the camera, reciprocating means which supports the focusing lens, and first signal generating means arranged to provide a sweep signal to sweep the two-dimensional matrix along at least one direction and to reciprocate the lens in synchronism, whereby areas of the sheet are consecutively focused onto corresponding areas of the camera matrix.

4,429,996
PROCESS OF FRACTIONATING ELECTROPHORETOGRAM SIGNALS

Shinichi Kamachi, Hino, and Toshihide Fujiwara, Fuchu, both of Japan, assignors to Olympus Optical Co. Ltd., Tokyo, Japan

Filed Apr. 22, 1981, Ser. No. 256,591
Claims priority, application Japan, Apr. 23, 1980, 55-52808
Int. Cl.³ G01N *27/28*
U.S. Cl. 356—344 2 Claims



1. A process of fractionating electrophoretogram signals, comprising the steps of: differentiating the electrophotogram signals from an electrophoretic detector so as to obtain differential signals of the first order; deriving a first series of logic signals depending on the sign of said differential signals of the first order; differentiating said differential signals of the first order so as to obtain differential signals of the second order; deriving a second series of logic signals depending on the sign of said differential signals of said order; and producing output logic signals which determine positions to fractionate said electrophoretogram signals, by deriving logical additions of (i) pulses representing rising ends of said first series of logic signals, (ii) the logical product of said first series of pulse signals and pulses representing rising ends of said second series of logic signals, and (iii) the logical product of signals obtained by inverting said first series of pulse signals and pulses representing the falling ends of said second series of pulse signals.

4,429,997

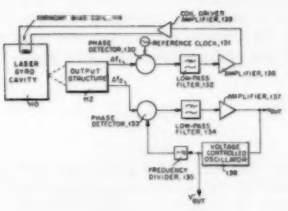
PHASE-LOCKED LOOP LASER GYROSCOPE SYSTEM

James B. Matthews, Wayland, Mass., assignor to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 890,423, Mar. 27, 1978, abandoned. This application Dec. 30, 1980, Ser. No. 221,685

Int. Cl.³ G01C *19/64*

U.S. Cl. 356—350 **16 Claims**



1. In combination:

means for providing a closed-loop path for sustaining propagation of circularly polarized electromagnetic waves of a plurality of frequencies;

means for producing a first signal having a frequency equal to the difference in frequency between two of said waves;

means for producing a second signal having a frequency equal to a predetermined multiple of the frequency of said first signal;

means comprising a phase detector for phase locking said second signal to said first signal;

said second signal being coupled to the input of said phase detector through frequency dividing means; and

the output of said phase detector being coupled to means for controlling the frequency of said means for producing said second signal.

4,429,998

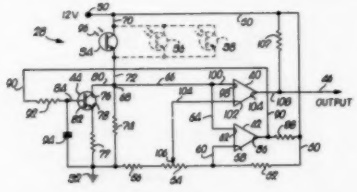
APPARATUS FOR THE DETECTION OF FAULTS IN CUPS, GLASSES OR THE LIKE

David E. Carson, Lawrence, and George W. Dalke, Overland Park, both of Kans., assignors to Carson/Burger/Weekly, Inc., Lawrence, Kans.

Filed Sep. 17, 1981, Ser. No. 303,170

Int. Cl.³ G01N *21/88*

U.S. Cl. 356—428 **3 Claims**



1. In apparatus for detecting fault conditions in plastic articles such as molded containers or the like:

means for supporting an article to be checked and for rotating the same about an axis of symmetry thereof;

means for directing light radiations toward said article;

means for receiving light radiations after the latter have encountered said article and for varying the magnitude of an electrically significant parameter from a predetermined normal level thereof in correlated relationship with changes in the intensity of said received light radiations; and

means electrically coupled with said receiving means and responsive to changes in the magnitude of said parameter for producing an output signal indicative of detection of a fault condition in said article, said signal being in the nature of an electrical pulse of predetermined polarity whenever the magnitude of said parameter is varied by said receiving means by at least a predetermined amount from said normal level in either the direction of exceeding said normal level or the direction of being exceeded by said normal level,

said receiving means comprising at least one photo-sensitive device, the internal electrical impedance through which varies in correlated relationship with the intensity of light applied to said device and in response thereto,

said signal producing means including

a direct current energized electrical circuit couplding said device in series with a resistance and presenting a node point therebetween, the electrical potential at said node point being affected by the amount of electrical current flowing thereto through said device, said current normally being at an intermedite, quiescent level in the absence of faults in said article,

electrical current sink means coupled with said node point for carrying electrical current away from the latter when said sink means is activated and having a control terminal for electrically activating the same,

first voltage comparator means having an input terminal electrically coupled with said node point, a reference terminal electrically coupled with a source of reference potential substantially equivalent to said quiescent level, and an output terminal,

electrical feedback path circuit means for coupling said output terminal of said first comparator means with said control terminal of said sink means, and

second voltage comparator means having an input terminal electrically coupled with said node point, a reference terminal electrically coupled with a source of reference potential less than said quiescent level, and an output terminal,

said first and second comparator means being operated relative to their respective differential voltage transfer characteristics for supplying a feedback signal from said output terminal of said first comparator means to said control terminal of said sink means for activating the latter whenever the electrical potential at said node point rises above the reference potential applied to said reference terminal of said first comparator means and for presenting a fault indicating signal at said output terminal of said second comparator means whenever the electrical current input to said node point varies either substantially above or substantially below said quiescent level.

4,429,999

METHOD FOR CALORIMETRIC ABSORPTION SPECTROSCOPY AND DEVICE FOR WORKING THE METHOD

Dieter H. Bimberg, von Broich-Str. 6, D-510 Aachen; Achim Bubenzer, Markenhofstr. 9, D-7815 Kirchzarten/Burg; Klaus F. K. Dransfeld, Sperberweg 23, 703 Böblingen, and Siegfried Hunklinger, Steinhöwelstr. 8, 7252 Weil d. Stadt, all of Fed. Rep. of Germany

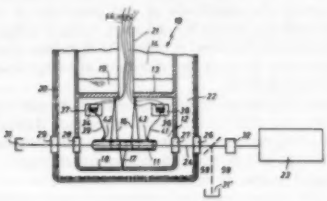
Filed Jun. 22, 1981, Ser. No. 276,181

Int. Cl.³ G01N *21/00*

U.S. Cl. 356—432 **11 Claims**

10. A calorimetric absorption spectroscopy device, wherein a sample is irradiated with a measuring-light pulse of a specific power, duration, and wavelength, and the absorbance of a sample at the corresponding wavelength of the measuring light is determined from the heating of the sample which occurs as a consequence of absorption of a portion of the measuring light, comprising a helium cryostat for cooling the sample to a temperature between 1.5 K. to 0.3 K., wherein the cryostat has a heat-insulated cooling chamber for containing the sample, said chamber having an entrance window for the measuring

light used to irradiate the sample, characterized by the fact that a temperature sensor is provided to detect the sample temperature, is mounted inside said cooling chamber and is shielded by a radiation shield against the incident measuring radiation, as well as the scattered radiation resulting from the latter.

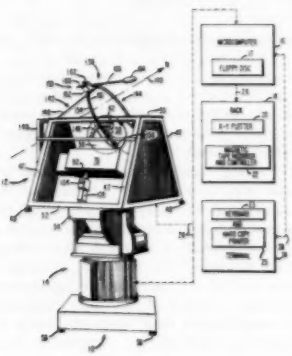


4,430,000

RADIATION MEASURING SYSTEM

Herman G. Eldering, Chelmsford, and Arthur W. Kliman, Beverly, both of Mass., assignors to Baird Corporation, Bedford, Mass.

Filed Jan. 19, 1981, Ser. No. 226,070
Int. Cl.³ G01J *1/10*; G01D *5/32*
U.S. Cl. 356—236 **10 Claims**



1. A radiometer comprising:
(a) an integrating sphere for admitting radiation;
(b) means for intermittently interrupting the admission of radiation in said integrating sphere;
(c) a source of reference illumination for calibrating said radiometer;
(d) said source of reference illumination being a structured spectral source;
(e) said structured spectral source being a continuous source with a structured spectral filter having strong absorption bands.

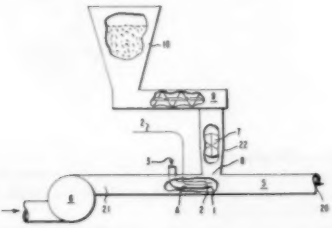
4,430,001

INJECTOR MIXER APPARATUS

George A. Schurr, Newark, Del., assignor to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Continuation-in-part of Ser. No. 106,402, Dec. 26, 1979, abandoned. This application Sep. 28, 1981, Ser. No. 306,593
Int. Cl.³ B01F *5/04*, *13/02*
U.S. Cl. 366—107 **4 Claims**

1. An apparatus for uniformly mixing a relatively small amount of material with a relatively large amount of another material in particulate form comprising a conveyer-pipe treatment chamber with an entrance end, a feed opening and a discharge end, a nozzle for introducing a mixture of a high pressure gas and the relatively small amount of material to be mixed having a discharge end housed within the conveyer-pipe treatment chamber and means for feeding the particulate material into said feed opening in the conveyer-pipe treatment chamber, said nozzle comprising an inner tube, from which the relatively small amount of material exits, concentrically arranged within an outer tube to form an annular opening between the outer tube and the inner tube from which the high pressure gas stream exits, said inner tube being shorter than the outer tube to permit the contents of the inner tube to be affected by the contents of the outer tube before reaching the discharge end of the nozzle, said feed opening located to permit all the particulate material to enter above the nozzle discharge end, said nozzle discharge end located within the conveyer-pipe treatment chamber so that the longitudinal axis of the nozzle and the conveyer-pipe treatment chamber are parallel, said nozzle discharge end positioned in said conveyer-pipe treatment chamber so that the nozzle discharge end is beneath the feed opening to the conveyer-pipe treatment chamber and within a vertical projection of the feed opening so that at least some of the material in particulate form can freely fall by gravity across the discharge end of the nozzle, the conveyer-pipe treatment chamber having means to cause a flow of low pressure gas to enter and flow parallel to the flow of high pressure gas.

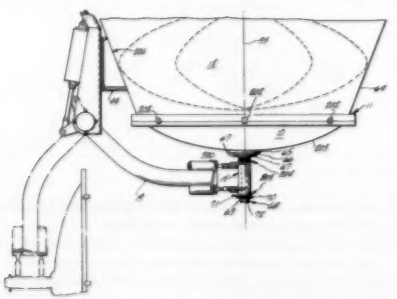


4,430,002

DOOR-OPERATING MECHANISM

Anthony A. Dongelmans, Hacienda Heights, Calif., assignor to Challenge-Cook Brothers, Inc., City of Industry, Calif.

Filed Mar. 16, 1981, Ser. No. 243,694
Int. Cl.³ B01F *13/06*
U.S. Cl. 366—139 **47 Claims**



1. A door-operating mechanism for a door to the mouth of a moveable container, the container being mounted for movement on foundation means and the mechanism being adapted for mounting on support means in adjacent relationship with the foundation means, and wherein the operating mechanism comprises anchoring means, moveable means extending from

the anchoring means, said moveable means being adapted for moving the door between a closed position with the mouth to the container and an opened position removed from the mouth, and clamp means between the door and the moveable means, the clamp means being adapted to release the moveable means from the door when the door is in the closed position with the mouth.

4,430,003

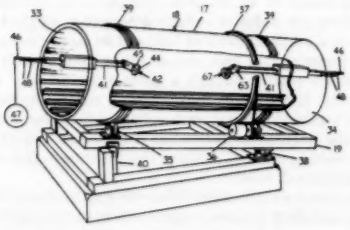
APPARATUS FOR SPRAYING LIQUIDS SUCH AS RESINS AND WAXES ON SURFACES OF PARTICLES

Norman W. Beattie, Surrey, and Donald W. Nyberg, North Vancouver, both of Canada, assignors to Hawker Siddeley Canada, Inc., Vancouver, Canada

Filed Nov. 18, 1980, Ser. No. 207,964

Int. Cl.³ B01F *9/06, 15/02*

U.S. Cl. 366—173 **35 Claims**



12. A blender used to effectively apply finely dispersed liquid droplets of resins and/or waxes, through surfaces of particles, comprising:

(a) a hollow drum rotatably supported on a frame for rotation about a downwardly inclined axis and having nonrotatable ends;

(b) a variable speed drive assembly to rotate the hollow drum at selectable optimum speeds to produce along its upwardly moving inner wall a thin layer of particles which leave and fall from the inner wall a small distance before reaching the uppermost peripheral point of travel to produce a free falling cascade of particles which is sufficiently dense to form an impervious curtain spaced from the downwardly moving inner wall of the hollow drum;

(c) a particle receiving assembly at the higher end of the rotatable drum;

(d) a particle discharging assembly at the other end of the drum;

(e) hollow nonrotatable cantilevered shafts positioned longitudinally within the hollow drum and extending from each end thereof;

(f) spray disc sprayers rotatably mounted respectively on the ends of the cantilevered shafts inside the hollow drum;

(g) power assemblies mounted respectively on the ends of the cantilevered shafts to rotate the respective spray disc sprayers to create spraying gravity forces of one thousand; and

(h) a liquid supply assembly connected to the shaft for delivering liquid to the spray disc sprayers, while the particles are being delivered and removed from the hollow rotating drum.

4,430,004

MULTI-FACED CLOCK

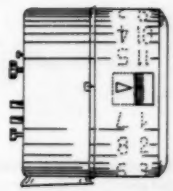
Noel N. Nitschke, 81 Sherwill St., Feilding, New Zealand

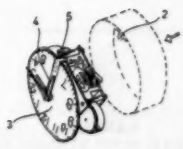
Filed Mar. 1, 1982, Ser. No. 353,190

Claims priority, application New Zealand, Mar. 12, 1981, 196485

Int. Cl.³ G04B *19/06*

U.S. Cl. 368—235 **4 Claims**





1. A clock comprising a housing member, a clock face mounted within said housing, at least one rotatable shaft mounted within said housing and extending through the center of said clock face, an hour hand inserted on the end of said shaft extending through said face to be rotated by said shaft to sweep over said face, means to drive said shaft mounted within said housing, an extension on said hour hand, a cylindrical member rotatably mounted within said housing to rotate about its central axis coaxially with respect to said shaft, means to connect said cylindrical member to said extension so that said cylindrical member is rotated by said hour hand synchronously therewith, two axially spaced sets of time sequenced indicia on the outer peripheral surface of said cylindrical member, said sets being out of phase by 180° and inverted with respect to each other so that the same indicia can be read simultaneously on diametrically opposite sides of said cylindrical member, and means on said housing member adjacent said peripheral surface to indicate the same time on each one of said sets of time sequenced indicia on opposite sides of said housing member simultaneously and coinciding with the time indicated on said clock face.

4,430,005

SPEECH SYNTHESIZER TIMEPIECE WITH ALARM FUNCTION

Kosuke Nishimura, Yamatokoriyama, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jul. 28, 1981, Ser. No. 287,559

Claims priority, application Japan, Jul. 28, 1980, 55-197180[U]

Int. Cl.³ G04B *19/30*

U.S. Cl. 368—67 **2 Claims**

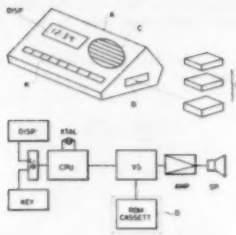
1. An alarm timepiece comprising:

means for setting a plurality of alarm times;

a removable and exchangeable read only memory device associated with said timepiece for storing data representing a plurality of messages;

speech synthesizer means associated with said exchangeable

read only memory device for outputting verbal messages represented by said data at said alarm times; and



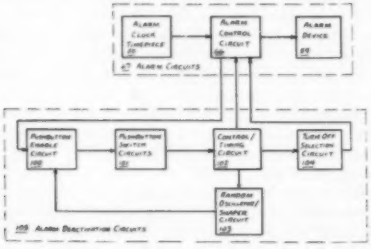
means for selecting which of said plurality of messages is outputted by said speech synthesizer means at each of said alarm times.

4,430,006

RANDOM MULTIPLE PUSH BUTTON CLOCK ALARM DEACTIVATION SYSTEM

Milton W. Jetter, 201 I St., SW., Apt. 838, Washington, D.C. 20024

Filed Sep. 9, 1982, Ser. No. 416,348
Int. Cl.³ G04B *23/02*
U.S. Cl. 368—73 **20 Claims**



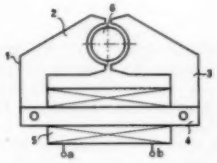
1. An alarm clock system comprising an alarm clock timepiece including alarm starting means for producing an electrical alarm signal, alarm means to generate an audible alarm responsive to said electrical alarm signal, alarm deactivation switch means comprising a plurality of switch circuits, each having a manually operated switch and an associated visual indicator, means to randomly enable a first switch circuit and simultaneously energize its visual indicator responsive to said alarm signal, means to sequentially randomly enable one or more of the other switch circuits and simultaneously energize their associated visual indicators responsive to successive operation of their manually operated switches as their associated visual indicators become energized, circuit means to disable said alarm means temporarily responsive to operation of the manually operated switch of the first switch circuit, and means to permanently disable the alarm means for the duration of said alarm signal responsive to sequential operation of a predetermined number of those manually operated switches whose associated visual indicators become sequentially energized.

4,430,007

METHOD OF REDUCING THE POWER CONSUMPTION OF THE STEPPING MOTOR OF AN ELECTRONIC TIMEPIECE AND AN ELECTRONIC TIMEPIECE EMPLOYING THE METHOD

Fridolin Wiget, Neuchatel, and Yves Guerin, Granges, both of Switzerland, assignors to ETA S.A. Fabriques d'Ebauches, Switzerland

Filed Aug. 10, 1981, Ser. No. 291,391
Claims priority, application Switzerland, Aug. 25, 1980, 6381/80
Int. Cl.³ G04B *19/00*; G04C *3/00*
U.S. Cl. 368—157 **13 Claims**



1. A method for reducing the power consumption of the stepping motor of an electronic timepiece, by automatically establishing the width of voltage drive pulses supplied to the motor, in accordance with its load and its supply voltage, the motor comprising at least one actuating coil, a stator and a rotor which rotates through a given angle when a voltage drive pulse is applied to said actuating coil, comprising the steps of measuring, during each voltage drive pulse, the variation in the magnetic induction flux in the stator, and interrupting the voltage drive pulse when this variation in flux reaches a predetermined value.

5. An electronic timepiece comprising an oscillator for producing a standard frequency signal, a frequency divider circuit which is connected to the oscillator to produce a low-frequency time signal, a stepping motor, comprising at least one actuating coil, a stator and a rotor, a supply circuit for periodically producing and supplying voltage drive pulses to the actuating coil in response to the time signal, and monitoring means for controlling the supply circuit for automatically establishing the width of the drive pulses in accordance with the value of the load and the supply voltage of the motor, the monitoring means comprising a measuring device for measuring, in respect of each voltage drive pulse, the variation in the magnetic induction flux in the stator and producing a measuring signal representing the value of the variation in flux, and means responsive to the measuring signal to apply to the supply circuit, a signal for interrupting the voltage drive pulse to establish its width when the variation in flux reaches a predetermined value.

4,430,008

QUARTZ OSCILLATION-TYPE ELECTRONIC TIMEPIECE

Yasuhiko Nishikubo, Saitama, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Jul. 7, 1981, Ser. No. 281,033
Claims priority, application Japan, Jul. 28, 1980, 55-102467; Aug. 12, 1980, 55-110745
Int. Cl.³ G04C *3/00*
U.S. Cl. 368—202 **2 Claims**

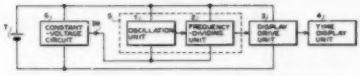
1. A quartz oscillation-type electronic timepiece comprising:
(a) a time reference source consisting of a quartz oscillator or the like;
(b) frequency-dividing means which receives time reference signals from said time reference source;
(c) a display drive unit which receives time unit signals from said frequency-dividing means;

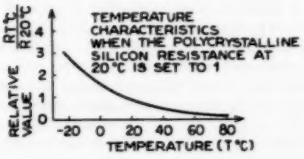
(d) a battery which supplies the energy to each of the above-mentioned portions; and

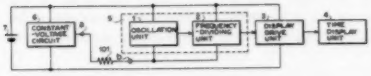
(e) a constant-voltage circuit which is connected between the terminals of said battery to make the voltage of said battery constant, and which consists of a current mirror-type reference voltage generator and a differential amplifier; wherein

(f) a current mirror type reference voltage generator is characterized in that it is composed of a pair of poles, a reference resistor is connected in series to an MOS transistor in the first pole, an output of the first pole becomes an input of the second pole, an output of the second pole is an input of the first pole and fed back with each other, plurality of MOS transistors are inserted between the MOS transistor connected to the output of the second pole and the drain of MOS transistor connected to the input of second pole, namely the reference voltage output terminal end, thereby the reference voltage higher than a voltage obtained before insertion of said MOS transistors as much as the sum of threshold voltages of said MOS transistors inserted can be generated;

(g) said reference resistor of said current mirror type reference voltage generating circuit is a polysilicon resistor having a negative temperature coefficient which can be







obtained by adding the process of implanting impurity ion in such a concentration sufficiently lower than that of source, drain diffusion to the standard silicon gate CMOS process and its resistance value is 1 M-ohms or more;

(h) said differential amplifier of a constant voltage circuit is characterized in that an output of second pole of the current mirror type reference voltage generator is provided as the gate input of the MOS transistor which operates as a constant voltage source thereof, a reference voltage output of the current type reference voltage generator becomes the first input of the differential amplifier, an output of differential amplifier is supplied to load electronic circuits through an inverter, a potential to be supplied to a load electronic circuit is fed back as the second input of the differential amplifier, and as a whole, an output of a constant voltage circuit is caused to have a low impedance and thereby the reference voltage is not changed by fluctuation of load electronic circuit;

(i) said time reference source through up to a time display device are made up of an integrated circuit consisting of complementary MOS transistors, and at least a portion of said integrated circuit is operated by a constant voltage produced by said constant-voltage circuit.

4,430,009

ARRANGEMENT FOR SECURING AND ELECTRICALLY CONTACTING A BATTERY IN A WATCH

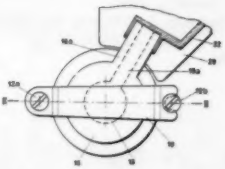
Jacques Müller, Reconvilier, Switzerland, assignor to ETA S.A. Fabriques d'Ebauches, Switzerland

Filed Mar. 27, 1981, Ser. No. 248,253

Claims priority, application Switzerland, Mar. 31, 1980, 2534/80

Int. Cl.³ G04B *1/00*

U.S. Cl. 368—203 **7 Claims**



1. An electronic watch comprising a plate; a printed circuit including an insulating substrate and at least one conductive track; and a fixing arrangement of a battery having first and second faces, comprising a clamp bar which is removably fixed at its two ends to a face of said plate and which passes over said first face of the battery, said second face of the battery resting on said plate; and electrical connecting means including a flexible insulating tongue having a first end fixed with respect to said insulating substrate and a second end which is disposed and maintained between said clamp bar and said first face of the battery and carrying a conducting layer which contacts a terminal in the said first battery face and is connected to a conductive track of the printed circuit, said flexible tongue being adapted to be bent for permitting easy removal of the battery.

4,430,010

THERMAL METHOD OF TESTING LIQUIDS FROM A NOZZLE

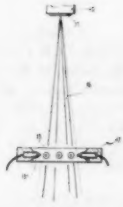
Christian Zrenner, Stuttgart, and Peter Kälberer, Gerlingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 19, 1981, Ser. No. 312,855

Claims priority, application Fed. Rep. of Germany, Dec. 2, 1980, 3045401

Int. Cl.³ B05C *21/00*; G01N *25/18*

U.S. Cl. 374—45 **12 Claims**



1. A method of testing a liquid flowing from a nozzle having a mouth, or the like, comprising the steps of

providing a plurality of sensing elements having tips and

located so that the sensing elements with the tips are arranged at a distance from the mouth and at a circle in a ring-like element and transverse to a stream of liquid flow from the mouth and to be tested, said flow stream passing through the ring-like element without moistening said tips;

heating the tips of the sensing elements;

directing the stream of liquid to be tested on the ring-like element and near the heated tips of the sensing elements, so that when a malfunction occurs in the nozzle, said flow stream widens and the liquid cools the heated tips and thereby an electrical signal is produced; and

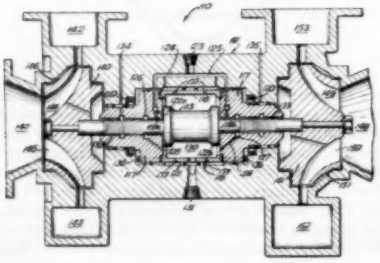
using the thus produced electrical signal for evaluating the liquid.

4,430,011

INTEGRAL BEARING SYSTEM

Leslie C. Kun, Grand Island, N.Y., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Aug. 2, 1982, Ser. No. 403,932
Int. Cl.³ F16C *27/02*
U.S. Cl. 384—99 **9 Claims**



1. A bearing system comprising:

(A) a stationary support housing having a longitudinal opening therethrough for positioning a rotatable shaft substantially aligned therein;

(B) an essentially non-rotatable bearing housing positioned between said shaft and said support housing comprising at least one pair of bearing means, each bearing means having a bearing surface for rotatably supporting said shaft, and a spacer portion between said pair of bearing means, said spacer portion not supporting said shaft;

(C) viscous damping means comprising a generally uniform annular space between said support housing and said bearing housing along at least a portion of theiuraxial length, said axial length portion being greater than the axial length of said bearing surfaces, said annular space being filled with a viscous material through said axial length portion; and

(D) a plurality of spaced elastic supports in contact with said bearing housing and said support housing.

4,430,012

PAPER GUIDE FOR LINE PRINTER

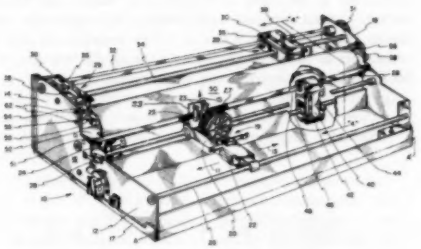
Wayne J. Kooy, Galein; Horst M. Krenz, St. Joseph, and Lawrence C. Unger, Benton Harbor, all of Mich., assignors to Zenith Radio Corporation, Glenview, Ill.

Continuation of Ser. No. 251,413, Apr. 6, 1981. This application Mar. 3, 1983, Ser. No. 471,767
Int. Cl.³ B41J *11/30*
U.S. Cl. 400—616.1 **13 Claims**

1. A paper feeding and guide apparatus for use in a bi-directional line printer having a frame including first and second structural support means, a plurality of cross-members coupled between said first and second structural support means including a platen and a print head having a printing surface facing said platen and supported on a first cross-member and arranged to move in a path of travel along said first cross-member a permitted distance for printing on paper positioned between said platen and said print head and moving in a generally perpendicular direction to said print head direction of movement, said apparatus comprising:

first rotatable paper drive means located below said platen for providing paper in a generally upward direction between said platen and said print head;

second rotatable paper drive means for receiving said paper following the transport of said paper between said platen and said print head and for transporting said paper in a plane generally perpendicular to the direction of movement of the paper between said platen and said print head; and



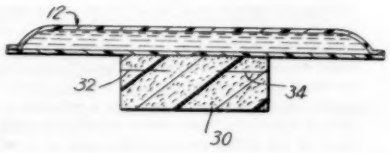
adjustable curved guide means positioned beneath and in contact with said paper between said platen and said second rotatable paper drive means and having a first lower end portion fixedly mounted to said platen, a second upper end portion, and third and fourth lateral end portions positioned intermediate said first and second end portions, wherein said first and second end portions form opposite, facing edges of said guide means and wherein said second upper end portion is adjustably mounted for movement in a direction parallel to the paper path thereat to said first and second structural support means by means of which the curvature at each lateral end portion of said guide means may be independently adjusted in adjusting the paper path length between the respective ends of said first and second rotatable paper drive means for precisely positioning the paper relative to said print head.

4,430,013

DISPOSABLE SWAB ARTICLE

Jack W. Kaufman, 357 Frankel Blvd., Merrick, N.Y. 11566

Continuation of Ser. No. 59,659, Jul. 23, 1979, abandoned. This application Nov. 19, 1981, Ser. No. 322,857
Int. Cl.³ A47L *13/17*
U.S. Cl. 401—132 **8 Claims**



1. An applicator package having distal ends comprising a foam applicator pad and having a backing member adjacent thereto: said backing member being formed of a relatively rigid, flat and stiff plastic sheet material having a vapor and gas barrier coating and a laminated deformable plastic coated foil material having at least one reservoir containing a flowable product, such as a liquid being sealed to said flat and stiff sheet

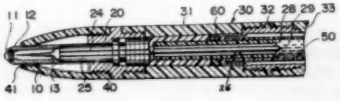
material for containing the contents of said reservoir therebetween; said flat and stiff sheet material having a centrally disposed linear weakened portion in the surface of said flat and stiff sheet material and said weakened portion being transversely disposed of said flat and stiff sheet material with said foam applicator pad secured to the outer surface of said flat and stiff sheet material and centrally disposed over said weakened portion; said weakened portion rupturing upon forcing said distal ends of said applicator package towards each other and about said weakened portion, so as to compress the reservoir of said deformable plastic coated foil material by crushing opposite sides of said reservoir against each other such that substantially all of said flowable product in the reservoir can be controllably released into said applicator pad for wiping applications upon pressure completely deforming and collapsing said plastic coated foil material; and said foam applicator pad is a foam block having opposite slits partially through said foam block so that when said distal ends are squeezed together, the foam block assumes an inverted T-shape with a large wiping contact surface area.

4,430,014

BALL POINT PEN WRITING INSTRUMENT

Kuo L. Tsai, Taipei, Taiwan, assignor to Cathay Pen Corporation, Taipei, Taiwan, a part interest

Filed Apr. 13, 1981, Ser. No. 253,877
Int. Cl.³ B43K *7/10*
U.S. Cl. 401—216 **8 Claims**



1. A ball point pen writing instrument comprising a pen casing having a front end and a rear end, a central opening at the otherwise closed front end;

a pen-nib holding means fitted at the front end of said casing;

a ball point pen-nib using an ink solution and being nested in front of said holding means by a portion thereof;

an ink storage means positioned at the rear of said casing;

an ink guiding means connected between said pen nib and ink storage means to convey the ink from said ink storage means to the pen nib, said ink guiding means including a capillary member and an ink guiding core, said capillary member having a relatively larger diameter portion at the middle and a relatively smaller diameter portion at the front and at the rear, said relatively larger diameter portion of said capillary member being tightly and frictionally held within the inner surface of the front of said casing, and the rear of the relatively smaller diameter portion of said capillary member being further tightly mounted at the central opening of the closed front end of said casing, the remainder of said relatively smaller diameter portion extending through said central opening at the front end of said casing and projecting out of the same, and having at least one longitudinal capillary groove extending the entire length of the outer surface of said capillary member for transferring ink from said longitudinal capillary groove of said capillary member to said pen nib;

a sealing means overslipped onto the rear relatively smaller diameter portion of said capillary member;

a vent means provided between the inner wall of said pen-nib holding means and the outer surface of the front of said ball point pen-nib;

said ball point pen-nib comprising a pen point housing, a rolling ball held at the pointer end of said pen point housing and an ink-guiding core including a front end having a greatly reduced slim portion and a minor portion of the rear end mounted at the end of said pen nib so that a considerable space is formed between said ink-guiding core and the inner wall of said pen point housing to store a sufficient amount of ink to effect a continuous capillary action for the writing point, the reduced slim point of said ink guiding core making no contact with said writing point;

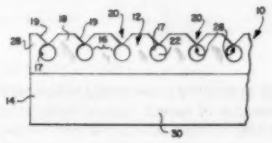
said capillary member and said ink guiding core being mounted in face-to-face abutment, the abutting face of said capillary member being provided with at least one capillary groove which communicates with said longitudinal capillary groove which is surrounded and enclosed within the housing of said pen-nib holding means and makes no substantial contact with the inner surface of said pen-nib holding means.

4,430,015

FASTENING MEANS FOR MAKING INSERTS IN WIRE BOUND NOTEBOOKS AND THE LIKE

John J. Nerlinger, Dayton, Ohio, assignor to Mead Corporation, Dayton, Ohio

Filed Jun. 6, 1981, Ser. No. 271,336
Int. Cl.³ B42F *13/00*
U.S. Cl. 402—79 **6 Claims**



1. A fastening means for attachment to a wire binder comprising a plurality of adjacently positioned tabs attached in a linear row to a base strip, each of said tabs being formed with the bulbous head portion and a post-like neck portion such that the head portions on two adjacent tabs form a V-shaped notch in the space between said tabs and the neck portions on two adjacent tabs form a generally circular aperture in the space between said tabs and an opening is formed between said notch and said aperture having a sufficient width such that said wire forming said binder passes from said notch into said aperture when one of said adjacent tabs is flexed out of a plane containing the other of said tabs and said wire is retained in said aperture when said tabs are not flexed.

4,430,016

BALL JOINT

Chikara Matsuoka; Kouzi Sawada, both of Toyota, and Takayoshi Sunayama, Hamamatsu, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha and Ishikawa Tekko Kabushiki Kaisha, both of, Japan

Filed Jun. 3, 1981, Ser. No. 269,843
Claims priority, application Japan, Jul. 8, 1980, 55-95808[U]
Int. Cl.³ B25G *3/00*; F16D *1/00*
U.S. Cl. 403—40 **3 Claims**

1. A ball joint (1) comprising:

a socket (2) having a cylindrical bore (6) having openings (9, 11) at opposite ends and an inwardly extending shoulder (10) at one opening (9) of said bore (6);

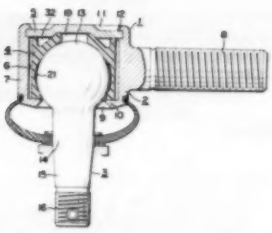
a ball stud (3) having a generally spherical head portion (13) disposed in said bore (6) and having a shaft (14) extending outwardly through said one opening (9);

an elastic bearing member (4) mounted in said bore (6) and comprising an annular hole having openings (19, 20) at opposite ends and defined by a generally spherical inner surface (17, 18) which slidably embraces said spherical head portion (13) of said ball stud (3) and cooperates therewith in an equatorial region (E) to define a lubricant receiving pocket (21);

one end of said bearing member (4) having a surface (22) engaging said shoulder (10) in said socket (2);

the other end of said bearing member (4) having an annular recess (25) therein around the opening (19) of said annular hole, a radial face (31) around said recess (25), and an annular dome-shaped projecting portion (26) between said recess (25) and said opening (19);

said bearing member (4) comprising a cylindrical outer peripheral surface (23) of substantially the same diameter as and engaged with the wall of said cylindrical bore (6), an elastically deformable tapered portion (24) of increasing diameter relative to said cylindrical surface (23) and engaged with the wall of said cylindrical bore (6) imparting preloading pressure to said bearing member in a radial



direction to thereby preload said spherical head portion, and a plurality of radially spaced apart axially extending grooves (28) between the ends of said bearing member (4) and extending radially inwardly partially into said bearing member from said outer peripheral surface (23) including tapered portion (24);

and a rigid plug (5) rigidly connected to said socket (2) and engaged with said radial face (31) and with said annular dome-shaped portion (26) of said bearing member (4) to resiliently impart a predetermined amount of preloading pressure to said bearing member (4) in a vertical direction to thereby preload said spherical head portion (13) of said ball stud (3);

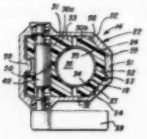
said plug (5) cooperating with said annular recess (25) to define a space (32) serving as an air cushion.

4,430,017

MUSICAL INSTRUMENT SUPPORT

Kenneth G. Stefancich, Chicago, Ill., assignor to Mardan Corp., Elkhart, Ind.

Filed Apr. 29, 1982, Ser. No. 373,006
Int. Cl.³ F16B 7/14
U.S. Cl. 403—104 **12 Claims**



1. A clamp for coaxially securing a post to a tubular support, comprising:

a housing having a through opening and a camming portion adjacent said opening defined by a midportion and converging planar guide surfaces;

means for securing the housing to a tubular support with the through opening aligned with the axis of the support;

resilient locking means in said opening having a blind recess in one end thereof and opening parallel to said housing through opening for receiving a camming means when the locking means is mounted in said opening, including a first U-shaped clamp member having a bight portion and spaced legs having end portions, a second U-shaped clamp member opposed to said first member and having a bight portion and spaced legs extending from adjacent said guide surfaces to adjacent said end portions of the first clamp member legs, the legs and bights of said first and second clamp portions cooperatively defining an included socket for receiving a post to be secured to the tubular support;

said camming means being disposed within said first clamp member bight portion for urging said first clamp member against the post and the post against said second clamp member to urge the second clamp member against said midportion and compressively urge the legs thereof against the guide surfaces to cause the legs of said second clamp member to be guided thereby toward the legs of said first clamp member to securely grip the post in said socket; and

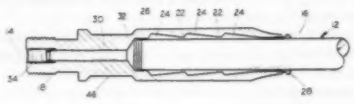
means for manually operating the camming means for selectively securing and releasing the post.

4,430,018

END FITTING FOR OIL WELL SUCKER RODS

Carlin P. Fischer, Omaha, Nebr., assignor to Technicraft, Inc., Omaha, Nebr.

Filed Apr. 11, 1983, Ser. No. 483,832
Int. Cl.³ F16B 11/00
U.S. Cl. 403—268 **5 Claims**



1. A sucker rod for oil wells, comprising:

an end fitting having an externally threaded first end and an open rod receiving second end,

said end fitting having a chamber portion extending inwardly from said second end for receiving one end of a cylindrical rod,

said chamber portion being defined by a plurality of spaceda-part annular ridges defining frusto-conical shaped cavities therebetween,

said end fitting having a central bore formed therein extending inwardly from said first end to said chamber portion,

a fiberglass cylindrical rod having one end positioned in said chamber portion,

an adhesive means bonded to said one end of said rod and received by said cavities to maintain said rod in said chamber portion,

a valve in said end fitting comprising an elongated valve stem portion positioned in at least a portion of the length of said bore, and a valve head on one end of said stem portion which is positioned in the inner end of said chamber portion, said central bore having an internally threaded outer end portion,

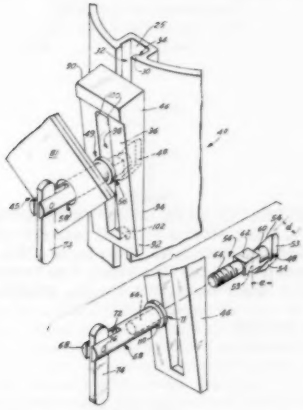
a screw means threadably mounted in said internally threaded portion adapted to engage the other end of said valve stem portion to forceably move said valve away from said first end against the inner end of the cylindrical rod in said chamber portion.

4,430,019

CONNECTOR ASSEMBLY

Michael S. D'Alessio, Flushing, N.Y., assignor to Harsco Corporation, Camp Hill, Pa.

Filed Feb. 4, 1981, Ser. No. 231,493
Int. Cl.³ B25G 3/00; F16B 2/14, 21/80; F16G 11/00
U.S. Cl. 403—409 45 Claims



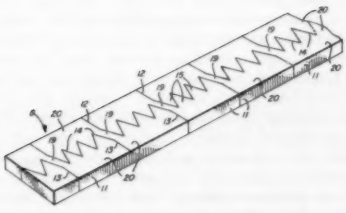
1. A connector assembly for use with a support element having an outwardly opening channel formed therein by a pair of spaced shoulders defining a slot, said assembly comprising a stud having a T-shaped head dimensioned to be received in said channel and a shank connected to said head to extend through said slot away from said head, said shank having a bearing surface thereon parallel to, spaced from and facing said head, and a tapered wedge having front and back surfaces and an aperture extending from said front surface to said back surface, the shank passing through said aperture so that the tapered wedge is slidably mounted on said shank between said head and said bearing surface for engaging said channel with its back surface and said bearing surface with its front surface to urge said head against an inner surface of the shoulders of the channel, thereby to firmly secure the stud to the support element, said shank having mounting means projecting from said bearing surface to be received in an apertured member for supporting the same.

4,430,020

DRIP IRRIGATION HOSE

Jackie W. D. Robbins, Rte. 3, Box 329A, Ruston, La. 71270

Filed Sep. 29, 1982, Ser. No. 428,361
Int. Cl.³ E02B 13/00; B05B 1/20
U.S. Cl. 405—43 14 Claims



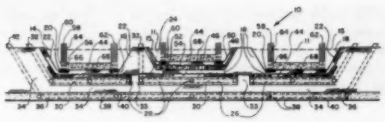
1. A drip irrigation hose comprising a primary conduit characterized by an elongated, resilient sheet having a first sheet edge, and a second sheet edge lapped over said first sheet edge; an elongated, resilient plate extending between said first sheet edge and said second sheet edge of said resilient sheet and having a first plate edge in the interior of said conduit and a second plate edge outside said conduit; and at least one flow path in said plate, at least one inlet aperture in said first plate edge of said plate and communicating with said flow path, and at least one outlet aperture in said second plate edge and communicating with said flow path for discharging water from said primary conduit.

4,430,021

SECURE CHEMICAL WASTE LANDFILL

Louis E. Wagner, Eggertsville; Randolph W. Rakoczynski, Youngstown, both of N.Y., and Harold F. Flannery, Batavia, Ohio, assignors to Ecological Professional Industries, Inc., Cincinnati, Ohio

Filed Nov. 23, 1981, Ser. No. 324,067
Int. Cl.³ E02C 3/00
U.S. Cl. 405—129 11 Claims



1. A chemical waste landfill comprising:
(a) a plurality of compartments separated by and lined with a primary clay liner;
(b) a single integral synthetic water impervious liner beneath the primary clay lining of all of said compartments;
(c) a primary underdrain system for each of said compartments beneath said synthetic liner, each of said primary underdrain systems comprising a network of liquid permeable first pipes imbedded in a first liquid permeable aggregate and means for removing liquid which enters said first pipes, said primary underdrain systems being separated from each other by clay footings;
(d) a single integral secondary clay liner beneath the primary underdrain systems and footings of all of said compartments; and
(e) a secondary underdrain system beneath said secondary clay liner, said secondary underdrain system comprising a network of liquid permeable second pipes imbedded in a second liquid permeable aggregate; and means for removing liquid which enters said second pipes.

4,430,022

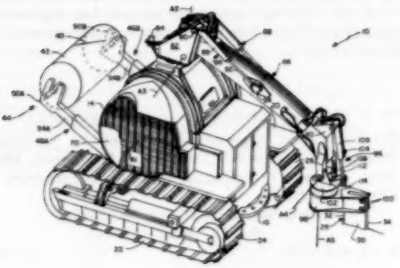
UNDERGROUND CABLE INSTALLING APPARATUS AND METHOD UTILIZING A MULTI-POSITIONABLE PLOW BLADE

Frank Kinnan, Camas Valley, Oreg., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Jun. 3, 1981, Ser. No. 269,955
Int. Cl.³ E02F 5/10
U.S. Cl. 405—183 12 Claims

1. An apparatus for installing cable underground, comprising: a power driven land vehicle having a front end, a back end and opposite sides; an elongated cable laying plow blade; a plow blade support arrangement mounted on said land vehicle and supporting said blade for movement with said vehicle, said arrangement having means including a boom supporting said blade and said boom for movement relative to said vehicle between a first cable laying position so that the blade is disposed within the ground and an inoperative second position with the blade above the ground, at any desired point along a predetermined 360° path around said vehicle and around a vertical axis through said vehicle, without having to move said vehicle, said supporting means also including means connecting said blade to the front end of said boom for 360° rotational

movement about an axis parallel with said blade whereby said blade can be pushed in front of or pulled behind said vehicle or moved along either side of the latter at various laterally spaced points; means including a supply of cable supported on and



movable with said vehicle; and means for feeding said cable from its supply to an in-ground point on said blade when the latter is in its cable laying position and said vehicle is moving and from said in-ground point on said blade into the ground along the path taken by said blade.

4,430,023

ROPE GUIDING DEVICE

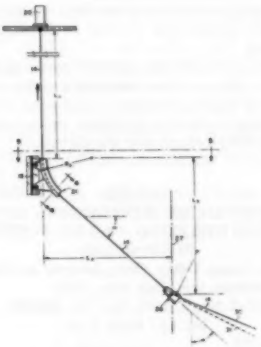
Donald A. Hayes; Lyle D. Finn, and Carl R. Brinkmann, all of Houston, Tex., assignors to Exxon Production Research Co., Houston, Tex.

PCT No. PCT/US80/01069, § 371 Date Dec. 17, 1981, § 102(e) Date Dec. 17, 1981, PCT Pub. No. WO82/00675, PCT Pub. Date Mar. 4, 1982

PCT Filed Aug. 21, 1980, Ser. No. 335,474

Int. Cl.³ E02D *21/00*; B63B *21/24*

U.S. Cl. 405—224 **6 Claims**



1. Rope guiding apparatus for use in anchoring an offshore structure in which a rope extends from said structure to an anchoring system on the ocean floor comprising:

a rope guide member affixed to said structure and having inner and outer housings;

the inner surface of said inner housing forming a three-sided pyramidal configuration, one of the corners of the pyramid forming a curved rope-contacting groove extending in a first plane, said groove and said rope having substantially the same circumferential radius;

said inner housing being rotatable within said outer housing to rotate and change said first plane of said groove to a second plane of said groove to bend said rope from said first plane to said second plane to accommodate the position of the anchor system relative to said platform, the second plane being the plane of the portion of said rope extending between said rope guide member and said anchor system.

4,430,024

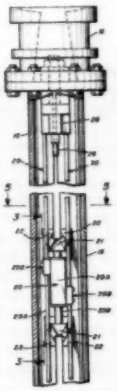
HYDRAULICALLY OPERATED MANDRELS

Charles L. Guild; Nicholas H. Werthessen, both of Barrington, and Carlton W. Aldrich, Jr., Cranston, all of R.I., assignors to American Pile Driving Corporation, East Providence, R.I.

Filed Aug. 5, 1981, Ser. No. 290,414

Int. Cl.³ E02D *11/00*

U.S. Cl. 405—232 **14 Claims**



1. An expandable tubular mandrel for use in driving or withdrawing tubular piles, said mandrel including a pair of lengthwise sections, a head connected to and joining the upper ends of said sections, said sections below said head movable between retracted, pile-entering and expanded pile-gripping relationships, and hydraulically operated means to effect said relationships, said means including a series of piston-cylinder units spaced lengthwise of the mandrel and means incorporating said units therein with their axes extending lengthwise thereof in a manner such that expanding and contracting forces are applied to the sections when the units are operated to vary their overall lengths, to effect mandrel expansion when the overall length of at least one unit is changed in one direction and mandrel contraction when the overall length of at least one unit is changed in the opposite direction, means operable to deliver pressurized hydraulic fluid to and from said units to thus effect their operation, and said incorporating means includes connecting means for each unit, one for the cylinder and one for the piston rod thereof, one connecting means connected to at least one mandrel section and the other to both of said sections and operable to exert at least one of said forces thereon with the overall lengths of the units changed in one and the same direction.

4,430,025

OBLATE FRICTION ROCK STABILIZER AND INSTALLATION LUBRICATING CEMENT UTILIZED THEREWITH

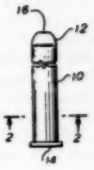
Armand Ciavatta, 703 Birch Hill Dr., Bridgewater, N.J. 08807

Division of Ser. No. 240,377, Mar. 4, 1981, Pat. No. 4,322,183, which is a continuation-in-part of Ser. No. 127,949, Mar. 7, 1980, Pat. No. 4,316,677.

The portion of the term of this patent subsequent to Feb. 23, 1999, has been disclaimed.

Int. Cl.³ E21D *21/00, 20/02*

U.S. Cl. 405—261 1 Claim



1. A method of supporting a mine roof strata with an elongated shank structure which comprises the steps of

drilling a vertical hole in the mine roof strata of a size to closely fit the exterior periphery of said shank structure at least at annularly spaced portions substantially throughout the vertical extent of the shank structure,

applying a hardenable viscous material to the wall of the drilled hole and moving the shank upwardly into the hole while the material is viscous to thereby reduce by a lubricating action the frictional resistance occasioned by the close interengagement of the periphery of the shank structure with the wall of the hole during the upward movement of the shank structure into the hole, and

hardening the viscous material after the shank structure has been moved upwardly fully into the hole to thereby increase by a cementing action the frictional gripping action of the exterior periphery of the shank structure with the mine strata.

4,430,026

ROOF SUPPORT SUITABLE FOR USE IN MINES

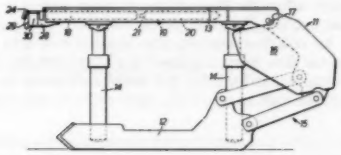
Nigel Hill, Pershore, and Dennis F. Rutherford, Cheltenham, both of England, assignors to Dowty Mining Equipment Limited, Great Britain

Filed Nov. 17, 1981, Ser. No. 322,283

Claims priority, application United Kingdom, Nov. 27, 1980, 8037974

Int. Cl.³ E21D *23/00*

U.S. Cl. 405—291 6 Claims



1. A roof support, suitable for use in mines, comprising a main roof-engageable member, a roof-engageable pad which is mounted upon said main roof-engageable member for upward movement with respect thereto in order to exert a thrust on the mine roof, guide means extending downwardly from the underside of said pad, a linkage pivotally-connected between said pad and said main roof-engageable member, and actuator means, located by said guide means adjacent the underside of said pad, which actuator means has an output member pivotally-connected to said linkage whereby when said actuator means is operated said output member moves said linkage and thereby said pad with respect to said main roof-engageable member to provide said upward movement, said actuator means itself being moved bodily by said linkage, with said pad, to be maintained so adjacent the underside of said pad, wherein said linkage includes a bell-crank member and a link member which are pivotally-connected together, said bell-crank member having rigidly interconnected first and second arms and said link member having a first end portion and a second end portion, the first arm of the bell-crank member being pivotally-connected to said pad and the second arm of the bell-crank member being pivotally-connected to said first end portion of said link member, while the second end portion of said link member is pivotally-connected to said main roof-engageable member.

4,430,027

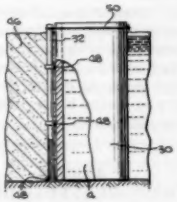
METHOD OF FORMING A FOUNDATION WITH LIQUID TIGHT JOINTS

John Hughes, Arlington Heights, Ill., and Heinz Rasbach, Mainring, Fed. Rep. of Germany, assignors to American Colloid Company, Skokie, Ill.

Division of Ser. No. 77,650, Sep. 12, 1979, Pat. No. 4,367,057. This application Aug. 26, 1981, Ser. No. 296,431

Int. Cl.³ E02D *5/10*

U.S. Cl. 405—303 6 Claims



1. In an isolation pipe adapted for vertical disposition between the side walls of a trench to form a removable bulkhead in a process of filling said trench with concrete or the like, the improvement for allowing easy removal of said isolation pipe while providing for an accurate and easily drilled positioning hole at the boundary of adjacent concrete sections, said improvement comprising:

a tubular drill guide member releasably attached to the outer surface of said isolation pipe with the longitudinal axes thereof being in parallel relationship, said member being of an easily drillable material, having a diameter generally smaller than that of said positioning hole and being releasably attached to said isolation pipe such that said member will automatically release from said isolation pipe and remain in said concrete where positioned when said isolation pipe is pulled from said trench after said concrete is poured and set.

4,430,028

FRONT-DISCHARGE NITRATE TRUCK

Richard M. Clayton, Highland, and Arthur . Johnson, American Fork, both of Utah, assignors to Savage Rite-Way Corporation, Salt Lake City, Utah

Filed Jul. 13, 1981, Ser. No. 282,873

Int. Cl.³ B65G *53/40*

U.S. Cl. 406—39 15 Claims

1. A front-discharge truck for transporting finely-divided, blowable materials comprising:

a truck frame supported by rear driving wheels and front steering wheels;

an elongated hopper having sloping sidewalls and a forward-located, discharge port supported by said truck frame;

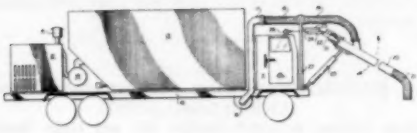
conveying means located adjacent the bottom of said hopper to convey material in said hopper to said forward discharge port;

an operator cab located proximate the forward wall of said hopper;

a vane-type feeder located underneath and communicating with said hopper discharge port;

an air blower having its discharge outlet connected by conduit means to the lower part of said vane feeder;

an articulated boom having at least two segments, one of which is an anchor segment pivotally attached to a support frame above the cab area, said boom having drive



means to swing the boom in a horizontal arc of about 180° from a position about perpendicular to the right side of the truck to a position about perpendicular to the left side of the truck;

boom elevation means to elevate and lower a forward section of the boom;

air and material transport conduit communicating with the discharge outlet of said vane feeder and communicating with said boom to provide discharge of air and material proximate the free end of said boom;

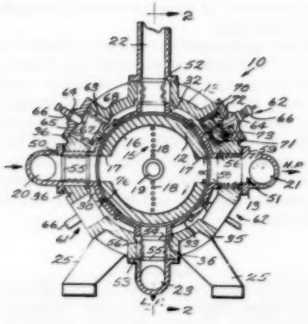
operator control means to control boom elevation, boom swing, conveying means, blower and vane feeder located within said operator cab.

4,430,029

HIGH PRESSURE FEEDER DEFLECTION COMPENSATION

Ole J. Richter, Karlstad, Sweden, and Johan C. F. C. Richter, St. Jean Cap Ferrat, France, assignors to Kamyr, Inc., Glens Falls, N.Y.

Filed Nov. 21, 1980, Ser. No. 209,118
Int. Cl.³ B65G *53/30, 53/46*
U.S. Cl. 406—63 **36 Claims**



1. A high-pressure transfer device including: a pocketed rotor containing a plurality of diametrically through-going pockets, said rotor rotatable about an axis; a housing enclosing said rotor, said housing having an exterior periphery and four ports disposed around the exterior periphery thereof for registry with inlets to and outlets from said through-going pockets; means for mounting said rotor in said housing for rotation with respect to said ports about said given axis of rotation, and in a given direction; screen means for screening particulate material above a predetermined size out of the liquid passing through at least one of said ports; and

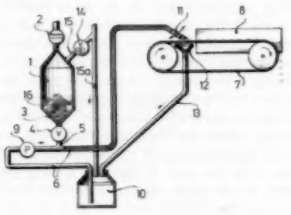
sealing means mounted to said housing and disposed between said rotor and said housing around the external periphery of said rotor and internal periphery of said housing for providing a biasing force and radially movable to provide minimized leakage of liquid between said rotor and housing while allowing relative rotational movement between said rotor and said housing.

4,430,030

OPERATING PROCESS FOR THE FORMATION OF A STEADY PARTICLE STREAM OF PARTICLES CONVEYED WITHIN A FLOW CONDUIT BY A FLOW MEDIUM AND ARRANGEMENT FOR EFFECTUATION OF THE PROCESS

Hans Langen, Jülich, and Helmut Ringel, Niederzier-Hambach, both of Fed. Rep. of Germany, assignors to Kernforschungsanlage Jülich GmbH, Fed. Rep. of Germany

Filed Jul. 29, 1980, Ser. No. 173,332
Claims priority, application Fed. Rep. of Germany, Aug. 1, 1979, 2931244
Int. Cl.³ B65G *53/40*
U.S. Cl. 406—146 **3 Claims**



1. In an operating process for the formation of a steady particle stream of particles which are conveyed within a flow conduit through the intermediary of a flow medium, said particles being introduced into said flow medium under the effect of gravity through an infeed conduit discharging into said flow conduit; the improvement comprising: regulating a partial flow quantity of the flow medium introduceable into the infeed conduit from a supply container by withdrawing said partial flow quantity from said infeed conduit in a direction counter to the flow direction of the particles in a flow region devoid of particles for the setting of the particle stream to be introduced into said flow conduit; venting any gas bubbles formed in said flow medium upstream of said infeed conduit to occlude the entry of gas bubbles into the infeed conduit which would adversely affect the flow of the particles stream in the flow conduit; reconveying said partial flow into said supply container for said flow medium after separation of said particles, said partial flow being regulated in a return conduit leading to said container; and venting gas bubbles entrained in the flow medium through an upwardly open outlet in said return conduit.

4,430,031

CUTTING TOOL

Erik I. Hellström, Sandviken, Sweden, assignor to Santrade Ltd., Luzern, Switzerland

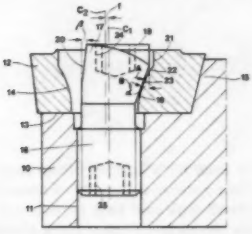
Filed Oct. 14, 1981, Ser. No. 311,264
Claims priority, application Sweden, Nov. 17, 1980, 8008038
Int. Cl.³ B26D *7/26*
U.S. Cl. 407—104 **6 Claims**

1. A cutting tool comprising:

a cutting insert holder having an insert-receiving site which includes a base surface, a side support, and a threaded bore in said base surface,

a positive cutting insert seated within said insert-receiving site in contact with said base surface and side support, said insert having a hole therethrough which includes a first contact surface decreasing in cross-sectional area in a direction toward said base surface,

a locking screw extending through the hole and threadedly mounted in said bore, said screw including a head disposed within said hole and including a second contact surface engaging said first contact surface and imposing a clamping force thereagainst to clamp said insert to said holder, said head being arranged eccentrically relative to



a longitudinal axis of said screw, the largest cross-section of said head being less than the smallest cross-section of said hole such that upon loosening of said screw by about one-half turn said insert is slidably removable over said head,

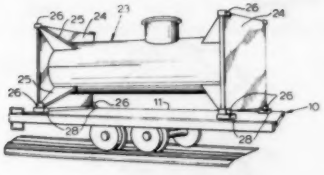
one of said first and second contact surfaces being of conical configuration, and the other being of convex configuration to produce point contact therebetween, said conical surface being oriented at an acute angle relative to said base surface so that said clamping force has directional components extending toward said base surface and said side support.

4,430,032

PEDESTAL CONTAINER LOCKING DEVICE

David P. Morgan, Hanover Park, Ill., assignor to Portec, Inc., Oak Brook, Ill.

Filed Sep. 22, 1981, Ser. No. 304,670
Int. Cl.³ B60P *1/64, 7/13;* B61D *5/06*
U.S. Cl. 410—68 **7 Claims**



1. A lading retaining means for a transporting vehicle having a flat deck in which the lading is in the form of a container having a corner fitting on at least four corners thereof and in the same horizontal plane, each fitting having a slot, receiving a latching lever for locking the container to the vehicle, a separate pedestal releasably supporting each corner of the container, and including a frame having a base, a platform spaced above said base, and end and sidewalls extending vertically of said platform and conforming to a corner fitting as the container is lowered onto said platform, one sidewall having a slot extending vertically therealong, parallel walls forming said slot, a latch lever extending along said slot between said parallel walls, a variable pivot for said latch lever, pivoting said latch lever between said parallel walls to move into said slot and into latching engagement with an associated corner fitting, said latch lever having an inwardly extending upper end having an upwardly facing strike surface, and having a lower end portion extending a substantial distance beneath said platform, a compression spring engaging the lower end portion of said latching lever and biasing said latching lever to engage said strike surface with a corner fitting as a container is lowered onto said platform, said compression spring having a movable seat its adjacent lower end of said latching lever and having a saddle on its end opposite said seat and adjacent the lower end portion of said latch lever, a stationary seat for an outer end of said spring means, said saddle having bearing engagement with said lower end portion of said latching lever, said movable seat for said compression spring having a leg portion extending along said spring for a portion of length thereof and a lock bar engageable with said leg portion and reacting against said movable seat and an adjacent wall defining a slot, preventing compression of said spring and thereby securely locking said latch lever from moving to a release position.

5. A lading retaining means for retaining lading to a flat decked transporting vehicle in which the lading is in the form of a container having a corner fitting on each corner thereof, in the same plane and in which each fitting has a vertical latch receiving slot, a pedestal supporting each corner fitting of the container, each having a base engageable with the flat deck of a vehicle, two right-angled walls extending upwardly of said base and forming side and end walls for engagement with the corner of a container, and a platform disposed intermediate the ends of said walls, forming a support for the container, said sidewalls each having parallel spaced vertically extending walls intermediate the ends thereof forming a vertically extending slot, a latch lever extending along said slot, a pivot pin for said latch lever extending across and mounted on said sidewalls beneath said platform, said latch lever having an enlarged opening disposed beneath said platform and through which said pivot pin extends, to form a variable pivot for said latch lever, a second pin disposed beneath said pivot pin and forming a reaction member for said latch lever as the container is lowered onto said platform during a loading cycle, said latch lever having a lower end portion disposed beneath said last mentioned pivot pin, a compression spring seated in said pedestal adjacent an outer end thereof, a movable seat for the inner end of said spring having a leg portion extending along said spring from the seating portion of said spring on said movable seat, a saddle on the side of said movable seat opposite said leg portion and biased by said compression spring to form a biasing member engaging the lower end portion of said latch,

the improvement comprising locking means for said latch lever including an elongated lock bar movable to engage said leg portion and hold said seat from movement in a direction to effect compression of said spring, and release of the latch, an opening in one wall of said parallel walls forming said slot, adjacent said lock bar, to accommodate assembly of said lock bar to engage said leg portion when said lock bar is in a locked position, means selectively operable to pivotally move said lock bar to engage said movable seat and axially move said lock bar to fit into said opening when in a locked position, to retain said lock bar in a locked position and prevent pivotal movement thereof upon the exertion of pressure on said compression spring by said latch.

4,430,033

SHEET METAL INSERT FOR FOAM PLASTIC

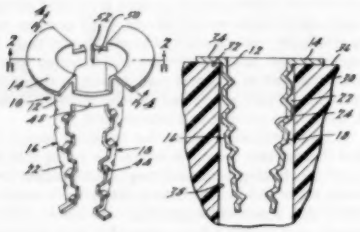
Arthur J. McKewan, Rochester, Mich., assignor to Microdot Inc., Darien, Conn.

Filed Apr. 22, 1981, Ser. No. 256,566
Int. Cl.³ F16B *13/06*
U.S. Cl. 411—61 **1 Claim**

1. A sheet metal insert for use in anchorage and fastening applications comprising:

a substantially cylindrical body portion with a collar at one end and two legs projecting downward from the other

end, said legs having inwardly projecting and substantially helically orientated ribs defining internal threads having imperforate leading and following flanks to correspond to and receive an externally threaded male fastening member, said legs including a plurality of formed teeth-like tangs disposed on either side of said legs to form an acute angle from the downward end of said legs, said tangs being formed progressively longer along said legs away from said collar, said legs being displaced sufficiently inwardly along the axis of said body to prevent



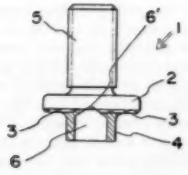
said tangs from interfering with installation of said insert in a preformed hole, said male fastening member being cooperable with said legs to force them laterally and embed said tangs into the wall of said preformed hole in which said insert may be located, said legs moving in an arc-like direction when forced outward by said male fastening member thereby pulling said sheet metal insert and thus said collar downward and firmly into abutting contact with the surface of a workpiece that contains said preformed hole.

4,430,034

STUD BOLT FOR METAL PANELS

Tatsuhichi Fujikawa, Fukui, Japan, assignor to Fukui Byora Co., Fukui, Japan

Filed Jul. 7, 1981, Ser. No. 281,041
Int. Cl.³ B23P *11/00*
U.S. Cl. 411—179 **5 Claims**



1. A stud bolt for a metal panel comprising:

a tubular shaped head portion having a first end face and a second end face and having a longitudinally extending hole open at said second end face;

a flat flange having a first surface fixed to said first end face of said head portion and a second surface opposite said first surface; and

a screw part extending longitudinally from said second surface of said flat flange;

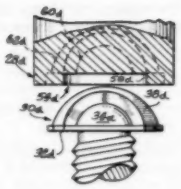
said head portion having an outer tubular surface and an inner tubular surface, said inner tubular surface defining the peripheral boundary of said hole, said head portion having a plurality of spaced peripherally longitudinally extending first grooves opening into said inner and outer tubular surfaces and said second end face.

4,430,035

FASTENER DRIVER HEAD AND TOOL AND COUPLING THEREBETWEEN

William G. Rodseth, Elgin, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Jul. 30, 1981, Ser. No. 288,423
Int. Cl.³ F16B *23/00*
U.S. Cl. 411—402 **8 Claims**



1. A driver head for a fastener comprising: a substantially disc-shaped base portion, a plurality of dome-shaped portions integrally formed with said base portion and concentrically located within one surface thereof and a plurality of ribs integrally formed with said base portion and alternating with said frustoconical portions and extending outwardly thereof, each of said ribs extending substantially from a diameter of said base to the outer periphery thereof in a substantially symmetrical configuration.

4,430,036

THREAD FORMING FASTENER

Eugene K. Chapman, South Dartmouth, Mass., assignor to Amca International Corporation, Hanover, N.H.

Division of Ser. No. 229,450, Jan. 29, 1981, Pat. No. 4,353,233.
This application Jun. 7, 1982, Ser. No. 385,703
Int. Cl.³ F16B *25/00*
U.S. Cl. 411—416 **7 Claims**

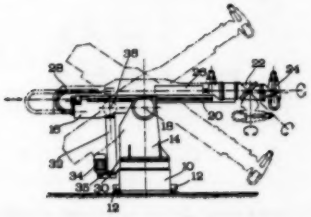
1. A thread-forming fastener having a shank portion with a continuous helical roll-threaded formation of uniform pitch, the crest of said thread defining a helix including in a plurality of turns of the thread arcuate regions merging gradually with intermediate arcuate lobes, said lobes having radii of curvature that are less than the radii of curvature of the arcuate regions, said thread having a depth that is at a minimum circumferentially midway between said lobes, said thread having a depth that is at a maximum at said lobes, and a lobe in one turn of the thread being circumferentially offset from the nearest lobe in an adjacent turn and in which said offset is one-half the circumferential spacing of two adjacent lobes.

4,430,037

INDUSTRIAL ROBOT WITH SEVERAL AXES OF ROTATION

Luciano Bisiach, Strada San Vito Revigliasco 350, 10100 Turin, Italy

Filed Aug. 17, 1981, Ser. No. 293,141
Claims priority, application Italy, Apr. 23, 1981, 6755 A/81
Int. Cl.³ B25J 9/00
U.S. Cl. 414—4 1 Claim



1. An industrial robot having several axes of freedom of movement with an operating members supporting arm pivotally mounted at the top of a supporting column for angular medium position and characterized in that angular positioning of said supporting arm is controlled by an electromechanical actuator having one end pivotally connected to said supporting arm in a position spaced from said horizontal axis of angular movement and the other opposite end pivotally connected to said supporting column and comprising

a. a threaded shaft mounted at its two opposite ends in bearings connected to each other by rigid walls forming at least one linear guide member;

b. a lead nut meshing with said threaded shaft and provided with at least one projecting lug for slidably engaging said linear guide member; and

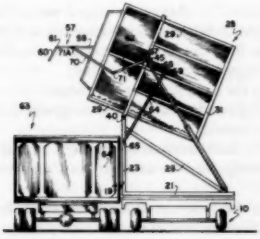
c. a tubular outer jacket secured to said projecting lug of said lead nut and being sealingly connected to one of said bearings of threaded shaft which is in the form of a piston and having a bottom provided with a gauged hole communicating with the atmosphere.

4,430,038

POWER DUMP WAGON

William Rempel, and Henry Rempel, both of Winnipeg, Canada, assignors to Greenbelt Farm Systems Inc., Winnipeg, Canada

Filed Oct. 27, 1980, Ser. No. 201,172
Claims priority, application Canada, Nov. 1, 1979, 338944
Int. Cl.³ B60P 1/34
U.S. Cl. 414—346 13 Claims



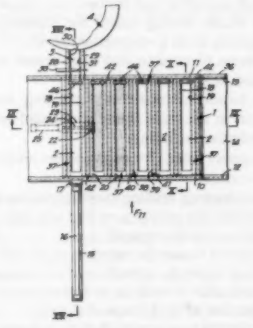
1. A power dump wagon comprising in combination a supporting main frame, a dump wagon box mounted within said main frame, means for mounting said box by one side thereof within said main frame for tilting movement relative thereto, from a substantially vertical, normal position to an inclined uploading position and vice versa, an endless unloading conveyor operatively mounted upon said one side of said box and extending substantially the full length and breadth thereof, said unloading conveyor being substantially vertical when said box is in the said normal position, and including an outer run and an inner run spaced and parallel with said outer run and situated between said outer run and said one side, means to move said box from one position to the other and further means to operate said conveyor wherein said outer run moves upwardly from adjacent the lower end of said one side towards the upper end thereof.

4,430,039

FIBRE LOADING DEVICE FOR A BRUSH MANUFACTURING MACHINE

Leonel P. Boucherie, Roeselare, Belgium, assignor to Firma G.B. Boucherie, Izegem, Belgium

Filed Feb. 20, 1981, Ser. No. 236,613
Claims priority, application Belgium, Feb. 26, 1980, 58426
Int. Cl.³ B65G 1/06
U.S. Cl. 414—417 5 Claims



1. A fibre loading device for a brush manufacturing machine having a fibre magazine, which device comprises:

(a) a displaceable table for mounting adjacent a fibre magazine and including a vertical wall disposable adjacent the magazine;

(b) means for displacing the table;

(c) a displaceable fibre box carried by the table, which box includes a plurality of adjacent fibre chambers, each fibre chamber being defined by a bottom, an open end wall disposable adjacent the fibre magazine, two side walls, and an end wall having a first aperture therethrough;

(d) a plurality of fibre cartridges, each fibre cartridge being disposable in a corresponding fibre chamber, with each fibre cartridge having a U-shaped chamber defined by a bottom, a fixed end wall having a second aperture therethrough, a removable end wall for temporarily securing the fibres in the fibre cartridge, and two side walls, each side wall including an inner longitudinal groove;

(e) means for displacing the fibre box to successively align the fibre cartridges with the fibre magazine; and

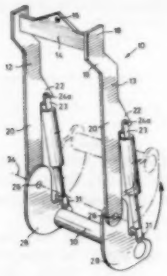
(f) means for transferring fibres from each fibre cartridge into the fibre magazine when each fibre cartridge is aligned with the fibre magazine and after the removable end wall of the fibre cartridge has been removed, the transfer means being movable through the first and second apertures of each fibre box and its corresponding fibre cartridge and through the cartridge, with the transfer means being guided by the longitudinal grooves in the fibre cartridge.

4,430,040

COIL UPENDER

George G. Halmos, 81 Munro Blvd., Willowdale, Ontario, Canada M2P 1C5

Filed Dec. 14, 1981, Ser. No. 330,037
Int. Cl.³ B66C 1/54
U.S. Cl. 414—783 4 Claims



1. A coil upending and transporting apparatus comprising:
a main frame having means for allowing the frame to be suspended from a suspension device,
a sub-frame pivoted to said main frame at a horizontal axis located below said means,
power means for positively pivoting the sub-frame with respect to the main frame about said axis,
the sub-frame including:
(a) support means for engagement under a coil whose axis is vertical,
(b) an elongate holding mandrel disposed so as to be parallel with the axis of a coil at one end of which the support means is engaged, and
(c) control means for moving said holding mandrel selectively (1) in the direction of its elongation, and (2) perpendicular to both its own elongation direction and the direction of said horizontal axis,
the horizontal axis at which the sub-frame is pivoted to the main frame being substantially aligned with the centre of gravity of the sub-frame when carrying a coil of average weight and size, thereby reducing the work required of the power means to positively pivot the sub-frame and coil about said horizontal axis.

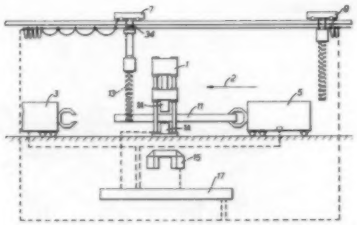
4,430,041

CRANE AND MANIPULATOR INTEGRATION

Trevor Hemingway, Dronfield, and Anthony E. Middleton, Swinton, both of England, assignors to Davy-Loewy Limited, Sheffield, England

Continuation-in-part of Ser. No. 181,660, Aug. 26, 1980, abandoned, which is a continuation of Ser. No. 941,404, Sep. 11, 1978, abandoned. This application Oct. 13, 1981, Ser. No. 310,728
Claims priority, application United Kingdom, Sep. 15, 1977, 38614/77
Int. Cl.³ B21J 13/10
U.S. Cl. 414—787 6 Claims

1. An installation, comprising:
an overhead crane movable along a first path;
electrical drive means for moving said crane along said first path;
manually operable control means for producing an electrical control signal;
control means for controlling said electrical drive means for said crane in response to said electrical control signal so as to bring about desired movement of said crane along said first path;
a manipulator movable along a second path which is parallel to and beneath said first path, and having a peel for supporting an elongate workpiece in a cantilever fashion;
drive means for moving said manipulator along said second path;
control means for controlling said drive means for said manipulator in response to said electrical control signal so



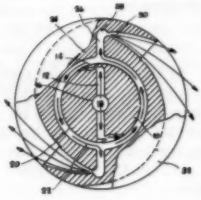
as to bring about desired movement of said manipulator along said second path; and
means arranged for receiving said control signal and for applying said control signal to both of said control means for said crane and said manipulator whereby said drive means of said crane and said manipulator are controlled together.

4,430,042

VELOCITY PUMP REACTION TURBINE

Palmer A. House, Walnut Creek, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Division of Ser. No. 98,450, Nov. 29, 1979, Pat. No. 4,332,520. This application Feb. 11, 1982, Ser. No. 347,821
Int. Cl.³ F01D 1/18
U.S. Cl. 415—1 10 Claims



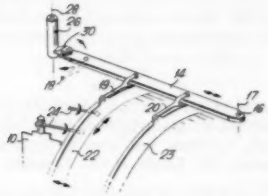
1. A method for converting stored energy of a hot pressurized fluid into rotational mechanical work comprising:
flowing the fluid outwardly through a plurality of first radial passageways in an inner assembly;
discharging the fluid substantially tangentially through a liquid nozzle at the end of each first passageway into a surrounding annular channel;
flowing the fluid outwardly through a plurality of second radial passageways in an outer rotor surrounding the channel;
discharging the fluid substantially tangentially through a second nozzle at the end of each second passageway in the rotor to impart rotation on the outer rotor;
the steps of flowing the fluid through the radial passageways of the inner assembly and discharging the fluid substantially tangentially into the annular channel being performed to cause the tangential velocity of the fluid to match the tangential velocity of the rotating outer rotor; and
taking mechanical work from the rotating outer rotor.

4,430,043

VARIABLE STATOR VANE OPERATING MECHANISM FOR TURBOMACHINES

Ronald W. Knight, and Clive E. Olive, both of Bristol, England, assignors to Rolls-Royce Limited, London, England

Filed Jun. 11, 1981, Ser. No. 272,550
Claims priority, application United Kingdom, Jun. 28, 1980, 8021304
Int. Cl.³ F01B 25/02
U.S. Cl. 415—159 5 Claims



1. A variable stator vane operating mechanism for a turbomachine comprising a beam, a pivot connection by means of which one end of the beam is connected to static structure of the machine, the machine having a longitudinal axis, said pivot connection enabling a pivoting movement of the beam about an axis substantially at right angles to the machine longitudinal axis, means allowing lengthwise movement of the beam, at least one unison ring supported both for rotation about and movement along the machine longitudinal axis, each unison ring being connected to the beam by a drag link which extends between the ring and the beam, a plurality of flexible first arms each of which is pivotably connected to a unison ring and to a vane to rotate the vane, and an actuating mechanism for moving the beam, said actuating mechanism comprising means for producing both said pivoting and lengthwise movements of the beam to rotate the unison rings, said actuating mechanism being so dimensioned and arranged that the longitudinal movement of the beam produced thereby is substantially matched to the movement of at least one unison ring along the machine longitudinal axis which is caused by pivoting of the associated first arms connected to the unison ring.

4,430,044

VERTICAL AXIS WIND TURBINE

L. Kenyon Liljegren, 1260 SE. Walnut #5, Tustin, Calif. 92680

Filed Nov. 23, 1981, Ser. No. 324,103
Int. Cl.³ F03D 7/06
U.S. Cl. 416—119 37 Claims

1. A wind turbine for obtaining power from a wind flow comprising;

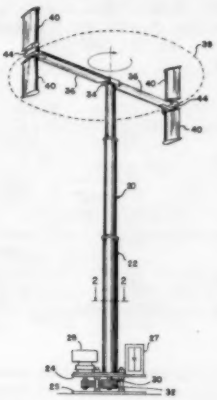
a support structure;

a rotor;

means for mounting said rotor for rotation on said support structure about an axis of rotation;

at least one blade form pivotally mounted on said rotor a distance from said axis of rotation for limited pivotal movement relative to said rotor, said blade form pivotally moving relative to said rotor in response to the force of a wind current against its sides to generate a rotational force for self-starting of said turbine and operation at low rotational speeds; and

means for controlling said pivotal movement of said blade form relative to said rotor, said means progressively biasing said blade form toward one selected orientation relative to said rotor and thereby progressively limiting said pivotal movement of said blade form in response to increased rotational velocity of said rotor, said control means prohibiting said pivotal movement of said blade



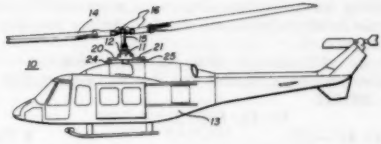
form at high rotational speeds of said turbine in a constant wind flow velocity.

4,430,045

HELICOPTER POWER TRAIN FOR DISTRIBUTING ROTOR BLADE FLAPPING DISPLACEMENTS THROUGH A PLURALITY OF DRIVE TRAIN COMPONENTS

Wesley L. Cresap, Forth Worth, Tex., assignor to Bell Helicopter Textron, Inc., Forth Worth, Tex.

Continuation of Ser. No. 32,776, Apr. 24, 1979, abandoned. This application Jul. 2, 1981, Ser. No. 279,705
Int. Cl.³ B64C 27/04
U.S. Cl. 416—138 5 Claims



1. A helicopter power train including a transmission for driving a multi-blade rotor for accommodating rotor tip-path plane flapping deflection comprising in combination:

(a) a resilient mounting including a plurality of independently operating mounts with travel limits for coupling the transmission to the fuselage of the helicopter, said mounting to accommodate from about 15% to 35% of said deflection,

(b) a flexible mast extending from said transmission to said rotor to accommodate from about 10% to 30% of said deflection,

(c) a yoke secured to said mast for connecting said blades to said mast, said yoke having a thin flexure section immediately outboard of said mast to accommodate from about 40% to 60% of said deflection, and

(d) each of said blades including means for providing beam bending to accommodate from 0% to about 10% of said deflection.

4,430,046

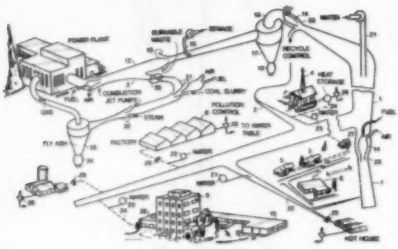
METHOD AND APPARATUS FOR TOTAL ENERGY SYSTEMS

Anthony J. Cirrito, Grafton, Mass., assignor to CTP Partners

Filed Jun. 18, 1980, Ser. No. 160,819

Int. Cl.³ F04F 5/00

U.S. Cl. 417—55 **18 Claims**



1. The method of generating a hot high pressure fluid stream comprising the steps of combustion of an oxygen bearing fluid and fuel, introducing a carbonaceous water bearing material into a pressure zone without substantial loss in pressure, transferring heat from said stream to react with and to evaporate the water from said material, separating the dried and unreacted parts of said material from said zone while continuing to substantially maintain said pressure in the remanent flow of product gas and water vapor, while continuing high static pressure in said flow after separating said parts for the optimal utilization of the heat content in said flow, and further whereby the delivery of product gas with minimal surplus steam is controlled by effecting, at the most, four independently varied steam sources including steam by direct heat transfer from at least two combustion reactions within the system, and further, whereby said combustion takes place in a confined space to deliver a transonic jet from a nozzle which emanates from said space into a mixing zone conforming to the low static pressure of said jet for receiving said material introduced at very low velocity in the range of 100 to 200 feet per second to interact violently with the combustion products in said jet.

4,430,047

PUMP ARRANGEMENT

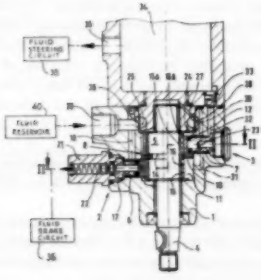
Rudolf Ilg, Aalen, Fed. Rep. of Germany, assignor to Zahnradfabrik Friedrichshafen AG, Friedrichshafen, Fed. Rep. of Germany

Filed Dec. 16, 1980, Ser. No. 216,966

Claims priority, application Fed. Rep. of Germany, Dec. 19, 1979, 2951012

Int. Cl.³ F04B 23/04, 1/04

U.S. Cl. 417—273 **9 Claims**



1. In a multiple pump assembly for supplying fluid from a common fluid reservoir to a plurality of fluid circuits, said pump assembly having a pump housing (1) and a drive shaft (4), the improvement residing in at least two radial piston pumps (2,3) having plungers (6,7) associated therewith, respectively, a common eccentric (5) mounted on the drive shaft having a common actuating surface in engagement with the plungers, said housing being formed with an eccentric chamber (8) enclosing the eccentric and a common suction port (20), and means mounted on the actuating surface of the common eccentric for dividing said eccentric chamber into separate compartments (11, 12) in fluid communication with said common suction port, said housing also being formed with annular channels (26/25, 26A/25A) through which fluid is conducted between the compartments and the common suction port.

4,430,048

DIAPHRAGM PUMP WITH A DIAPHRAGM CLAMPED IN PRESSURE-BALANCING ARRANGEMENT

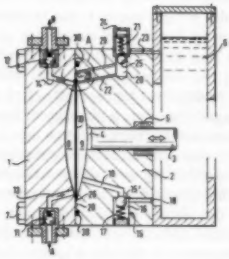
Horst Fritsch, Leonberg, Fed. Rep. of Germany, assignor to Lewa Herbert Ott GmbH & Co., Leonberg, Fed. Rep. of Germany

Filed Dec. 29, 1981, Ser. No. 335,410

Claims priority, application Fed. Rep. of Germany, Dec. 29, 1980, 3049341

Int. Cl.³ F04B 43/06

U.S. Cl. 417—383 **13 Claims**



1. A diaphragm pump including at least one diaphragm separating a delivery chamber from a working chamber filled with a hydraulic medium, said diaphragm being firmly clamped between a cylinder body and a cylinder cover at a clamping surface formed by the peripheral edge portion of said diaphragm, and further including hydraulic diaphragm drive means in the form of a reciprocating displacement piston slidably disposed within said cylinder body between said working chamber and a hydraulic fluid reservoir, characterized in that a pressure balancing space is provided to be radially outside and to encircle said diaphragm clamping surface, said pressure balancing space communicating with said working chamber or with said hydraulic fluid reservoir through at least one communicating passage, and in that a separate annular seal member is disposed to be radially outside said pressure balancing space between said cylinder cover and said cylinder body to seal-off said pressure balancing space and said working chamber from the outside.

4,430,049

RIPPLE REGULATOR IN A LIQUID SUPPLY SYSTEM

Masahiko Aiba, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Apr. 8, 1982, Ser. No. 366,704

Claims priority, application Japan, Apr. 22, 1981, 56-61833

Int. Cl.³ F04B 11/00

U.S. Cl. 417—540 **4 Claims**

1. In a liquid supply system including a pump system for developing the liquid by means of a movement of a piston included therein, and a ripple regulating system for minimizing

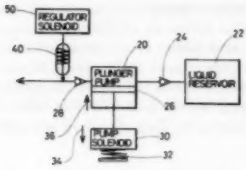
pressure ripples created by said pump system, said ripple regulating system comprising:

a ripple regulator including:

a pressure chamber;

inlet means for introducing the liquid developed from said pump system into said pressure chamber;

outlet means for developing the liquid from said pressure chamber; and



a resilient member secured to said pressure chamber so as to vary the volume of said pressure chamber;

a solenoid mechanism connected to said resilient member for varying said volume of said pressure chamber; and

drive control means for activating said solenoid mechanism in synchronization with the movement of said piston included in said pump system.

4,430,050

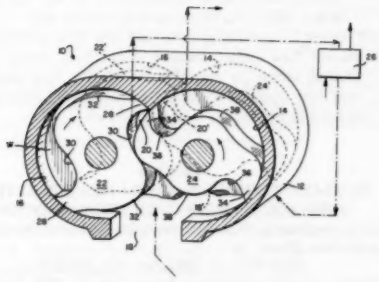
ROTARY, POSITIVE-DISPLACEMENT MACHINE

Theodore E. Blazejewski, Corning, N.Y., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Jan. 25, 1982, Ser. No. 342,122

Int. Cl.³ F01C *1/24;* F04C *18/00*

U.S. Cl. 418—191 **28 Claims**



1. A rotary, positive-displacement machine,

with interengaging lobed-rotors having different-sized lobes, adapted to handle a fluid, comprising:

a housing;

said housing having a pair of parallel, cylindrical, intersecting bores, end walls for said bores, and first and second ports for the conduct therethrough of high-pressure and low-pressure fluid, respectively, wherein

said first port is formed in one of said end walls;

first and second lobed-rotors rotatably mounted in said bores;

said first rotor has a hub which occludes said first port, and a groove which exposes said first port;

said hub has a radius of not more than ninety percent of the radius of the bore in which said first rotor is mounted;

said first rotor has a pair of grooves which, together, occupy less than one-half the circumference of said first rotor;

said first rotor has a pair of lobes which, together, occupy not more than approximately one-sixth the circumference of said first rotor;

said first rotor has an axial center;

each lobe of said pair thereof has, relative to a given rotary direction, an outermost leading tip and a first, intermediate reference point;

each lobe further has a flank defined by convex and concave surfaces;

said convex and concave surfaces describe first and second arcs, respectively; and

said first arc is drawn from a second reference point which is traversed by a line extending between said axial center and said first reference point.

4,430,051

REACTION VESSEL

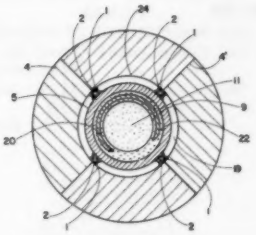
Baltzar C. von Platen, Ystad, Sweden, assignor to F. D. International, Ltd., London, England

Filed Dec. 8, 1980, Ser. No. 213,897

Claims priority, application Sweden, Dec. 20, 1979, 7910512

Int. Cl.³ B01J *3/04, 3/06;* C01B *31/06;* B30B *15/34*

U.S. Cl. 425—77 **17 Claims**



1. A reaction vessel for use in a high temperature, high pressure process for forming diamonds, diamond powder, boron nitride and similar substances, said reaction vessel including:

an inner hollow housing defining a reaction chamber therein,

an outer shell surrounding and supporting said inner housing to transfer pressure applied to the outer surface of said outer shell, to said inner housing and said reaction chamber, and

a fluid flow passageway provided between said inner housing and said outer shell through which flows a cooling fluid for receiving and transporting heat from the reaction chamber of the reaction vessel before said heat penetrates said outer shell.

4,430,052

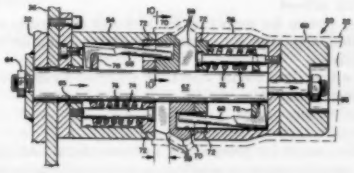
BELLING MANDREL ASSEMBLY

Robert P. Olsson, Renton, Wash., assignor to Western Plastics Corporation, Tacoma, Wash.

Filed Jul. 12, 1982, Ser. No. 397,533

Int. Cl.³ B29D *23/00*

U.S. Cl. 425—392 **15 Claims**



1. A belling mandrel assembly for enlarging the end of a softened plastic pipe, comprising:

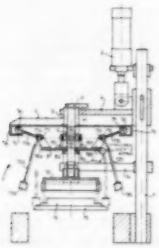
(a) a frame,
(b) mounted on the frame, socket molding means comprising:
(1) lip mold forming means
(2) base mold forming means engaged coaxially with the lip mold means
(3) seal pocket forming means interposed between the lip mold forming means and base mold forming means,
(4) shifting means engaging the seal pocket forming means for shifting it radially from retracted position to advanced position, and
(5) retracting means engaging the seal pocket forming means for moving it radially from advanced position to retracted position.

4,430,053

APPARATUS FOR SEALING TARTS OR PIES

Noël Launay, Beauvais, France, assignor to Societe d'Assistance Technique pour Produits Nestle S.A., Lausanne, Switzerland

Filed Sep. 2, 1982, Ser. No. 414,486
Claims priority, application France, Sep. 8, 1981, 81 17012
Int. Cl.³ B29C *17/08*; A21C *11/10*
U.S. Cl. 425—510 **5 Claims**



1. An apparatus for sealing tarts or pies, particularly almond tarts, essentially characterised in that it comprises a plate intended to receive the product to be subjected to the confection process, a mould of suitable shape situated above said plate and fixed to a shaft capable of making an ascending-descending movement with a means for applying pressure to said product and

a means associated with said mould consisting of lateral arms supporting at their ends means for nipping and cutting into the periphery of the product to be obtained, said arms being activated in such a way that said nipping and cutting means are applied to said product when the mould is in its lower position.

4,430,054

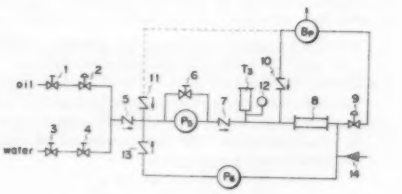
OIL-WATER MIXING AND SUPPLYING SYSTEM

Mitsumasa Furuya, Tokyo, Japan, assignor to Nihon Eikan Shido Center Co., Ltd., Tokyo, Japan

Filed Nov. 19, 1981, Ser. No. 323,173
Claims priority, application Japan, Dec. 20, 1980, 55-180802
Int. Cl.³ F23J *7/00*
U.S. Cl. 431—4 **1 Claim**

1. A system for supplying an oil-water mixture to a burner including apparatus for continuously emulsifying the mixture, comprising:

(a) a first flow circuit operative when said burner is operative including
oil supply means,
water supply means,
first means for pumping oil and water from said respective supply means to said burner when said burner is operative, including flow regulating means for limiting the flow of oil and water therethrough when said first pumping means is operative, and for providing a bypass passage for said oil and water when said first pumping means is inoperative,
means, disposed upstream of said burner, for mixing said oil and said water prior to being delivered to said burner, said mixing means including stationary agitator elements, and
means for accumulating excessive increases in flow pressure and means for detecting said flow pressure increases, said detecting means being operatively coupled with said accumulating means and said first pumping means to define an auxiliary pumping means, whereby when said burner is operative, actuation of said detecting means causes inactivation of said first pumping means, and release of the excess pressure in said accumulating means into said first flow circuit, thereby maintaining the flow of said oil and water therethrough;



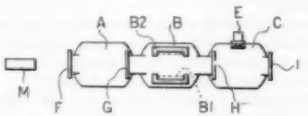
(b) a second flow circuit operative when said burner is inoperative including
said mixing means, and
second means for pumping said oil and said water, said second pumping means being positioned downstream of said mixing means and providing continuous circulation of said mixed oil and water through said mixing means, thereby maintaining emulsification of said oil and said water while said burner is inoperative; and
(c) means for switching from said first flow circuit to said second flow circuit, located in said first circuit, and including means for detecting increases in flow pressure in said first circuit and means for absorbing abnormal increases in pressure in said first circuit.

4,430,055

SEMI-CONTINUOUS VACUUM HEAT-TREATING FURNACE, AND ITS OPERATION PROCESS

Michio Sugiyama, 7-21, Takamoridai 3-chome, Kasugai-shi, Aichi-ken, Japan

Filed Feb. 17, 1982, Ser. No. 349,672
Claims priority, application Japan, Feb. 17, 1981, 56-21826
Int. Cl.³ C21D *1/74, 1/06*; F27D *3/00*; F27B *5/04*
U.S. Cl. 432—11 **3 Claims**



1. A semi-continuous vacuum heat-treating furnace comprising:

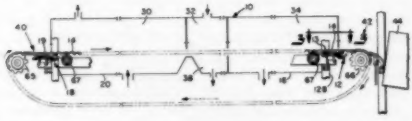
(a) a charging door and a carriage door installed respectively to charging and discharging ports at forward and rear sides of the furnace;
(b) a vacuum heating chamber constituted at front portion of the furnace, said vacuum heating chamber having a heating element and a heat insulation material both are stable

in chemical property and strength in vacuum condition and atmospheric pressure at high temperature;
(c) a cooling chamber constituted at rear portion of the furnace; and
(d) an intermediate vacuum door disposed within the furnace and for separating the vacuum heating chamber and the cooling chamber with each other.

4,430,056
PRESSURE ACTUATED SEAL FOR TRAVELLING GRATE

Virgil C. Rostvold, Nashwauk, Minn., assignor to The Hanna Mining Company, Cleveland, Ohio

Filed Mar. 16, 1982, Ser. No. 358,643
Int. Cl.³ F27B *9/26*; F27D *1/18*; C21B *7/16*
U.S. Cl. 432—137 **26 Claims**

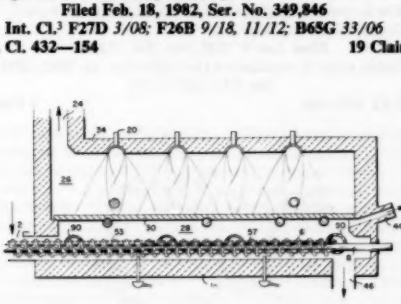


1. A pressure actuated sealing system for a travelling grate having a plurality of pallets each with an irregular bottom surface including a generally horizontal lower surface and a downwardly extending seal plate engaging means at the leading edge thereof, said system including a windbox mounted below said travelling grate for creating a pressure differential across said travelling grate, a dead plate disposed below said travelling grate, said seal plate engaging means sliding on said dead plate as said grate travels, a horizontally elongated rigid seal plate, and means for pivotably mounting said seal plate for pivoting movement about an axis parallel to and below said dead plate thereby to follow the bottom contour of the pallets, said seal plate pivoting upon engagement by said seal plate engaging means and against a pressure differential created by said windbox from a first angular position in which an edge of said plate is proximate said horizontal lower surface of said pallet to a second angular position in which said edge of said seal plate is more distant from said lower surface of said grate, said seal plate returning to said first angular position after passage of said seal plate engaging means, thereby to follow the irregular bottom surface of said pallets.

4,430,057
CALCINER SCREW CONSTRUCTION

Donald P. Hoover, Lansdale; Michael A. Csapo, Wyncote, and Ernst A. Siemssen, Gwynedd, all of Pa., assignors to Selas Corporation of America, Dresher, Pa.

Filed Feb. 18, 1982, Ser. No. 349,846
Int. Cl.³ F27D *3/08*; F26B *9/18*, *11/12*; B65G *33/06*
U.S. Cl. 432—154 **19 Claims**

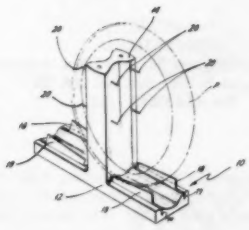


12. A calciner comprising
(a) a heat source for heating a material,
(b) a screw type conveyor arranged to convey said material while exposed to said heat source, said conveyor having at least one pair of mated conveyor screws, each said conveyor screw comprising a shaft having screw flights attached thereto, the flight pitch of one screw in the pair being opposite from that of the other screw in the pair, the screws of each pair intermeshing with each other and rotating in opposite directions to advance material to and through said calciner,
(c) lifter means attached to said screws and rotating therewith for moving said material from beneath said shaft upward for contact with heat from said heat source, for mixing and cascading said material downward and for absorbing heat from said heat source and conducting said heat to said material,
wherein said lifter means comprise multiple substantially rigid members extending outwardly from said screw flight, extending in a direction substantially tangential to said conveyor screw shaft inner circumference, spaced from said conveyor screw shaft mounted on at least that portion of said screw flights where said material exits said calciner.

4,430,058
CERAMIC WORKPIECE HOLDER

John J. Ryan, and Peter P. Laskey, both of 7809 Walker St., Philadelphia, Pa. 19136

Filed Apr. 12, 1982, Ser. No. 367,490
Int. Cl.³ F27B *5/00*
U.S. Cl. 432—259 **8 Claims**



1. A ceramic workpiece holder comprising: an elongated base member; a support post upwardly standing from said base member and dividing said base member into separate support portions; a pair of elongate grooves extending along each said separate support portion; and a plurality of pairs of blades, each said pair in parallel spaced-apart relationship positioned in respective ones of said groove pairs.

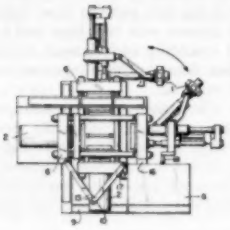
4,430,059
INJECTION PRESS

Friedrich B. Bielfeldt, Eppingen, Fed. Rep. of Germany, assignor to Maschinenfabrik J. Dieffenbacher GmbH & Co., Eppingen, Fed. Rep. of Germany

Filed Feb. 18, 1982, Ser. No. 350,032
Claims priority, application Fed. Rep. of Germany, Feb. 20, 1981, 3106379
Int. Cl.³ B29F *1/00*
U.S. Cl. 425—190 **8 Claims**

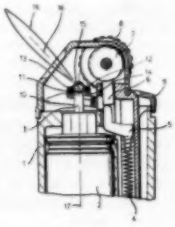
1. An injection press for the processing of hot deformable substances, comprising:
a machine base having a first vertical height and an upper support surface;
a machine bed having a second vertical height lower than said first vertical height;
a mold closure unit having a pivot point and containing a mold, said mold closure unit having one wall constructed to support said mold closure unit horizontally on said upper support surface;

a preplasticizing unit attached to said mold closure unit;
a support bearing attached to said machine bed;
a first bracket pivotally attached between said support bearing and said mold closure unit pivot point, said support bracket having a length permitting said mold closure unit to be moved between a first horizontal position on said upper support surface, wherein said pivot point is adjacent



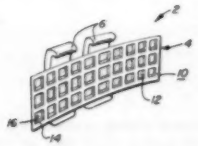
said machine base, and a second horizontal position in said upper support surface while said bracket pivots between corresponding first and second positions;
means for securing said bracket to said machine base when said mold closure unit is in said first position such that said mold closure unit may be pivoted to an upright position about said pivot point while being supported by said first bracket.

4,430,060
GAS LIGHTER
Alfred Racek, Seitenberggasse 54, 1160 Wien, Austria
Filed Jun. 2, 1981, Ser. No. 269,724
Int. Cl.³ F23Q *1/02*
U.S. Cl. 431—276 **2 Claims**



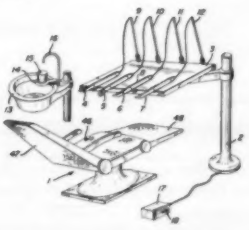
1. A lighter comprising:
a housing having a flame opening;
a fuel supply tank in said housing for feeding fuel to a point at which a flame is formed in said opening, said tank having an axis and a nozzle means extending along said axis to said point, said opening being inclined to said axis;
a friction wheel mounted in said housing;
a first guide passage formed in said housing along a radius of said friction wheel and parallel to said axis but within an axial projection of the tank;
a flint in said guide passage and displaceable therein for the engagement of one end of said flint with the periphery of said wheel adjacent said point;
a second guide passage formed in said housing parallel to said first guide passage and said axis and offset outwardly from said first guide passage and extending alongside said tank;
a helical coil flint spring in said second guide passage; and
a displaceable offset generally Z-shaped pushrod between said flint and said spring, said pushrod having a first portion extending into said first guide passage and engaging the other end of said flint and a second portion extending into said second guide passage and engaging said spring, said first and second portions being joined by a third portion lying substantially perpendicular to said first and second portions.

4,430,061
ORTHODONTIC BRACKET ASSEMBLY
David E. Webb, Jamul, and Lawrence F. Andrews, San Diego, both of Calif., assignors to Johnson and Johnson, New Brunswick, N.J.
Continuation-in-part of Ser. No. 203,826, Nov. 3, 1980, Pat. No. 4,369,033. This application Sep. 21, 1982, Ser. No. 420,677
The portion of the term of this patent subsequent to Jan. 18, 2000, has been disclaimed.
Int. Cl.³ A61C *3/00*
U.S. Cl. 433—9 **6 Claims**



1. An improved orthodontic bracket of the type including a pad having a surface adapted to be bonded to the exterior surface of a tooth, the pad having a tooth abutting surface with a plurality of cavities, said cavities defined by cavity walls, said bracket produced by a process comprising the following steps:
casting said bracket as a unitary piece with the surface of said bracket having a cast irregular surface character, said casting step comprising the step of metal injection molding said bracket;
providing an abrasive medium; and
tumbling said cast bracket in the abrasive medium, the particles of the abrasive medium adapted so as not to smooth over the walls of said cavities but to smooth a substantial portion of the remainder of said tooth abutting surface and of said bracket surface.

4,430,062
DENTAL APPARATUS WITH A NUMBER OF DENTAL INSTRUMENTS CONNECTED TO A COMMON CONTROL CIRCUIT AND A COMMON OPERATOR UNIT
Frank Henrichsen, Dragor; Flemming Hansen, Ballerup, and Kim Sorensen, Lyngby, all of Denmark, assignors to A/S Flex Dental, Glostrup, Denmark
Filed Jun. 9, 1981, Ser. No. 272,061
Claims priority, application Denmark, Jun. 13, 1980, 2551/80
Int. Cl.³ A61C *1/02*
U.S. Cl. 433—28 **9 Claims**



1. A dental apparatus comprising an instrument carrier with

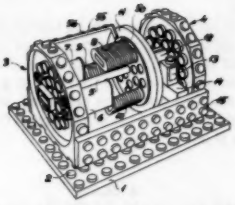
a number of dental instruments arranged removably in individual positions in said carrier, instrument removal signal generators individually associated with each of said instrument positions, a control circuit common to said dental instruments, an instrument selector device incorporated in said control circuit and connected to said removal signal generators an instrument energizing and control device in said control circuit for energizing and controlling only one instrument at a time when selected by said selector device, an operator unit common to said instruments for controlling the energization and control of said selected instrument by said energizing and control device, said operator unit comprising a control member which is movable out of a home position to perform an instrument energizing movement, means in said control circuit for sensing said instrument energizing movement and actuating said energizing and control devices in response thereto, selectively actuable function energizing devices for actuating auxiliary functions during a dental treatment, which are not related to the operation of the dental instruments; at least one such functioning energizing device being incorporated in said common control circuit, a mode switching device incorporated in said common control circuit and controlled by said instrument selector device for switching the dental apparatus between first and second modes of operation in response to at least one instrument being removed from its position or all instruments assuming their respective positions in said instrument carrier, respectively, first and second input control units incorporated in said common control circuit and being connected to said operator unit by said mode switching device in said first and second mode respectively, said first input control unit being connected with said instrument energizing and control device in said first mode and said second input control unit being connected with said at least one function energizing device for energizing the auxiliary function governed by said device in response to movement of the control member of said operator unit in said second mode of operation.

4,430,063

ELECTRICAL MACHINES CONSTRUCTIONAL SET

Erik Bach, Billund, and Jorgen P. J. Gronbjerg, Vestervig, both of Denmark, assignors to Interlego A.G., Baar, Switzerland

Filed Jun. 24, 1982, Ser. No. 391,518
Claims priority, application Denmark, Jun. 30, 1981, 2896/81
Int. Cl.³ G09B *23/18*
U.S. Cl. 434—380 **4 Claims**



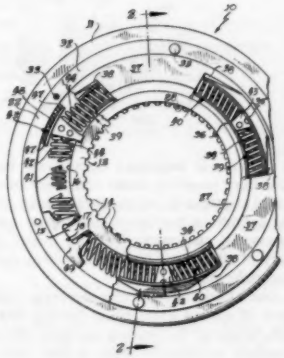
1. A building set for building a plurality of models of different types of electrical machines each comprising a rotor and a stator and having a plurality of magnetic elements mounted on the stator in a predetermined arrangement depending on the particular type of electrical machine to be constructed by the assembly of the components of the building set, said building set comprising a base plate provided with coupling means for detachably mounting a pair of stator elements thereon, said stator elements having bearing apertures for mounting a rotor shaft therebetween and a plurality of coupling means for detachably mounting a plurality of magnetic elements in a predetermined arrangement on the stator elements, said magnetic elements having complementary coupling means, said building set further comprising a substantially disc-shaped rotor element adapted to be mounted on the rotor shaft intermediate the stator elements and said rotor element comprising a plurality of coupling means for detachably mounting a plurality of magnetic elements having complementary coupling means in selected positions depending on the arrangement of the magnetic elements mounted on the stator elements as determined by the type of machine to be built by the components of the building set wherein the coupling means of the rotor element is a plurality of coupling holes, and the coupling means of the magnetic elements is a pair of complementary coupling prongs.

4,430,064

SERIES DAMPER ROTARY AND FORCE VECTOR LAG CONTROL SYSTEM

Paul E. Lamarche, Utica, Mich., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Dec. 18, 1981, Ser. No. 332,033
Int. Cl.³ F16D *3/14*
U.S. Cl. 464—64 **12 Claims**



1. A vibration damper assembly to transmit torque between driving and driven members, comprising an input member operatively connected to torque input means, a hub member operatively connected to torque output means and having at least two circumferentially equally spaced radial fingers thereon, at least one spring separator located between adjacent hub fingers and floating independently of said hub member, compression spring sets interposed between said hub fingers and spring separators, and a pair of retainer plates substantially enclosing said hub member, spring separators and spring sets and operatively connected to said input member, said retainer plates having axially aligned elongated arcuate slots separated by inwardly offset drive straps and adapted to receive and retain said spring sets, the improvement comprising a friction lag plate carried on and radially reciprocable to each hub finger, each lag plate having outwardly diverging edges terminating in an arcuate outer edge, said spring sets engaging the opposite diverging edges of each friction lag plate to provide a force vector acting to urge the lag plates radially outwardly to frictionally engage said retainer plates.

4,430,065

BARTLETT COUPLING

Robert R. Peterson, Hudson, Mass., assignor to Barry Wright Corporation, Newton, Mass.

Filed Oct. 8, 1980, Ser. No. 195,240
Int. Cl.³ F16D *3/52*
U.S. Cl. 464—90 **11 Claims**

1. A flexible coupling of the type comprising:
a driving member rotatable about a first axis;
a driven member rotatable about a second axis;
a first intermediate member;
first coupling means for coupling said first intermediate

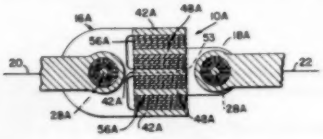
member to said driving member so that said first intermediate member is capable of pivoting with respect to said driving member about a third axis transverse to said first axis when torque is applied to said driving member;

a second intermediate member;

second coupling means for coupling said second intermediate member to said driven member so that said second intermediate member is capable of pivoting with respect to said driven member about a fourth axis transverse to said second axis when torque is applied to said driving member;

third coupling means for coupling said first intermediate member to said second intermediate member so that said second intermediate member is capable of moving in shear with respect to, as well as rotating with, said first intermediate member when torque is applied to said driving member;

wherein said first and second coupling means each comprises cylindrical laminated elastomeric bearing means and said third coupling means comprises substantially flat laminated elastomeric bearing means, each of said first and second cylindrical laminated elastomeric means and said flat laminated elastomeric bearing means comprising a plurality of alternating layers of resilient and nonextensible materials; and



wherein one of said intermediate members includes at least one pair of spaced apart plates having first and second parallel opposing flat bearing surfaces, the other of said intermediate members includes at least one plate having opposing sides for defining parallel third and fourth flat bearing surfaces, said one plate being disposed between said spaced apart plates so that said first flat bearing surface opposes said third flat bearing surface and said second flat bearing surface opposes said fourth flat bearing surface, and said flat laminated elastomeric bearing means are disposed between said first and third flat bearing surfaces and between said second and fourth flat bearing surfaces.

4,430,066

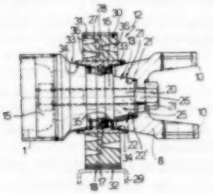
RESILIENTLY SUPPORTED CONNECTION UNIT FOR JOINING A TRANSMISSION SHAFT TO A TRANSMISSION COUPLING ELEMENT

Mario Benassi, Turin, Italy, assignor to RIV-SKF Officine Di Villar Perosa S.p.A., Italy

Filed Jul. 24, 1981, Ser. No. 286,573

Int. Cl.³ F16C *27/06*

U.S. Cl. 464—178 **10 Claims**



1. A connection unit for connecting one end of a shaft to a transmission coupling element and for resiliently supporting said end comprising a connection element arranged to connect said end of said shaft to said coupling element, said connection element having at least one axially extended portion with a substantially pyramidic shape forming a plurality of flat lateral surfaces, each flat lateral surface portion of said substantially pyramidic portion defining a first active surface, wherein at least one of said coupling element and said end of said shaft include an end portion having a pyramidic shape forming a plurality of second active surfaces equal in number to and adapted to mate with said first active surfaces, said connection element being provided with at least one rolling track for a row of revolving bodies;

a ring which is also provided with a rolling track;

a row of revolving bodies being disposed between said connection element and said ring; a frame, and means for resiliently supporting said ring from said frame.

4,430,067

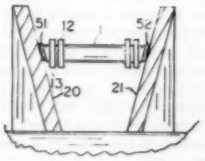
VARIABLE SPEED DRIVE WITH NO SLIPPAGE BETWEEN BELT AND SHEAVES

Ranald O. Whitaker, 4719 Squire Dr., Indianapolis, Ind. 46241

Filed Apr. 20, 1981, Ser. No. 234,968

Int. Cl.³ F16G *51/80, 51/16*

U.S. Cl. 474—244 **3 Claims**



1. In a friction drive system utilizing a chain for transferring power from an input pair of conical sheaves to an output pair of conical sheaves and in which the chain carries a set of pins which wedge between the conical sheaves;

a set of shoes, each of said shoes being appended to a respective end of a respective pin of said set of pins;

each of said shoes being adapted for making contact with the conical surface of a respective sheave of said input pair of sheaves and each of said shoes being adapted for making contact with the conical surface of a respective sheave of said output pair of sheaves, each of said contacts being generally a line contact along a slant height of said respective sheave;

appendance of each of said shoes to said respective pin being such that subsequent to the making of said line contact between said shoe and one of said respective sheaves, movement of said shoe relatie to said pin in a linear direction parallel to said line contact is permitted, and movement of said shoe relative to said pin in a direction circumferential to said sheave is not permitted.

4,430,068

PROCESS FOR THE MANUFACTURE OF A PACKAGING CONTAINER AND ASSEMBLY ITEMS

Dieter vom Hofe, Cologne, and Klaus Meyer, Kaarst, both of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Düsseldorf-Holthausen, Fed. Rep. of Germany

Filed Nov. 30, 1981, Ser. No. 326,169

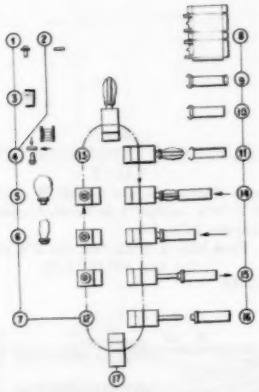
Claims priority, application Fed. Rep. of Germany, Dec. 4, 1980, 3045710

Int. Cl.³ B31B *7/00*

U.S. Cl. 493—100 **6 Claims**

1. A process for the manufacture of a packaging container consisting of a mechanically stabilizing case of paper, cardboard, metal, plastic or a combination thereof and a sealing liner inserted therein in the form of a hollow, thin-walled plastic extension with a neck part integrally attached to said plastic extension and adapted to extend above said case, com-

prising the steps of inserting said plastic extension with a neck part integrally attached thereto into an adapter cover adapted to cover an opening in said stabilizing case and having first means to cooperate with means in said neck part to frictionally seal and to prevent movement in a circumferential direction around said neck part while forming a liquid tight seal, and second means adapted to fasten said adapter cover to said stabilizing case, assembling a precut blank into a case adapted



to enclose said plastic extension, said case having an opening therein and means to receive and permanently clasp said adapter cover second means, inserting said plastic extension with said adapter cover into said case whereby said means to receive and permanently clasp, receives and permanently clasps said second means, and obtaining an integral packaging container consisting of a stabilizing case with cover having a plastic extension therein with an integrally attached neck extending above the cover.

4,430,069

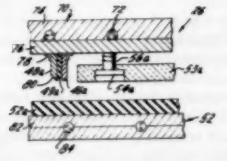
METHOD AND APPARATUS FOR SEALING AND CUTTING PLASTIC FILMS

Richard S. Carlisle, Box 307, Rye, N.Y. 10580

Continuation-in-part of Ser. No. 941,721, Sep. 12, 1978, Pat. No. 4,256,024, Ser. No. 714,746, Aug. 16, 1976, Pat. No. 4,113,169, and Ser. No. 427,443, Dec. 21, 1973, Pat. No. 3,975,885, which is a continuation-in-part of Ser. No. 231,288, Mar. 2, 1972, Pat. No. 3,815,794. This application Mar. 16, 1981, Ser. No. 244,065

Int. Cl.³ B31B *1/64*

U.S. Cl. 493—203 **9 Claims**



4. The method of making a seal between a pair of films and, concurrently, penetrating the films along the seal, including the steps of assembling a pair of films each having at least a layer of thermoplastic material facing the other film, supporting said films on a resilient counter, heating a severing blade to a temperature high enough to penetrate the films at least largely by fusion, retaining a body of resilient material of poor heat conductivity against a lateral surface of the severing blade, thereby to establish heat-transfer from the blade to said body of resilient material and producing a temperature gradient at the film-engaging surface of the body that decreases with distance from the blade, and pressing the blade against the films on the counter to cause the blade to penetrate the films and thereupon to cause the resilient body to bear against and seal the films together adjacent the outline penetrated by said blade while accommodating thickening of the seal being formed.

4,430,070

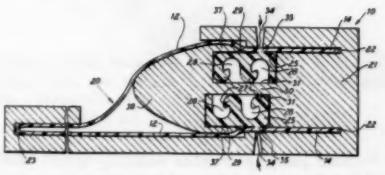
METHOD OF AND APPARATUS FOR UNINTERRUPTEDLY ASSEMBLING COMPONENTS FOR MAKING BAGS

Steven Ausnit, New York, N.Y., assignor to Minigrip, Inc., Orangeburg, N.Y.

Filed Aug. 11, 1981, Ser. No. 291,966

Int. Cl.³ B31B *1/64, 1/90*

U.S. Cl. 493—215 **18 Claims**



1. A method of uninterruptedly assembling components for making bags having sheet material wall panels and an openable mouth defined by pull flanges adapted to be pulled apart for opening the bags

providing preformed wall panel sheet material having a pull flange area along an edge;

providing a preformed extruded plastic flexible interlocking closure strip, having opposite faces one of which has profile means adapted for separable interlocking with complementary profile means on another closure strip and the other face providing a base surface of substantial width directly opposite said profile means;

continuously longitudinally advancing both said sheet material and said fastener strip at the same speed and guiding said fastener strip to cause said base surface to engage in face-to-face relationship with the surface of said wall panel material along the inner side of the pull flange area and substantially spaced from said edge;

and continuously securing a minor width longitudinally extending portion of said base surface adjacent to said pull flange area as a hinge attachment to said wall panel material but leaving the remainder of said base surface inwardly from the secured minor width portion free from said wall panel material so that said strip is adapted to swing hingedly relative to said wall panel material.

4,430,071

FEED SEAL FOR BOTTOM FEED CENTRIFUGE

Charles A. Willus, Bethel; Kenneth D. Lewis, Wilton, and Julian Langer, Stamford, all of Conn., assignors to Dorr-Oliver Incorporated, Stamford, Conn.

Filed May 27, 1982, Ser. No. 382,732

Int. Cl.³ B04B *11/00*

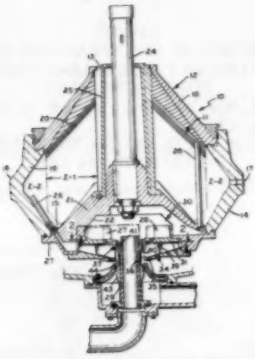
U.S. Cl. 494—38 **10 Claims**

1. A nozzle type centrifuge adapted for a two-phase separation of a feed slurry into a nozzle discharge underflow slurry and an overflow of separated liquid, comprising

(a) a rotor having a rotor bowl of double conical configuration with an upper conical portion having a top opening for discharging said overflow, a wide bottom opening and a peripheral intermediate portion having discharge nozzles for said underflow,

(b) a first pumping chamber at said wide bottom of said rotor bowl and having a set of pumping vanes for delivering a feed slurry to vertical feed pipes to rotatable separating discs in said rotor bowl,

(c) a bottom central slurry feed pipe at the base of said centrifuge having a discharge end in said first pumping chamber,



(d) a second pumping chamber vertically spaced beneath said first pumping chamber and having pumping vanes for impelling underflow slurry returned from said peripheral portion of said rotor bowl to said discs,

(e) a central passageway concentric with said rotor between said chambers, and

(f) sealing means provided in said passageway between said chambers to prevent the feed slurry from said feed chamber from entering said lower return pumping chamber.

4,430,072

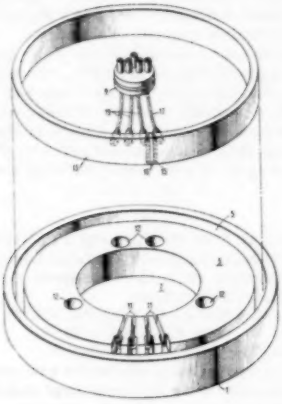
CENTRIFUGE ASSEMBLY

Robert M. Kellogg, Endwell; Victor R. Kruger, Apalachin, and Alfred P. Mulzet, Endicott, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 3, 1977, Ser. No. 803,007

Int. Cl.³ B04B 7/08

U.S. Cl. 494—45 **19 Claims**



1. A centrifuge assembly comprising a rotor bowl, a circular filler piece received in said bowl and providing a space between the circumference of said filler piece and the inner wall of said bowl, the space between said filler piece and the wall of the bowl defining a circular channel in said assembly, a disposable ring-like container of semirigid material having a substantially rectangular cross section contained in and conforming to said channel and having two ends, fluid connections to each end of said elongated container, and guide means for said fluid connections.

4,430,073

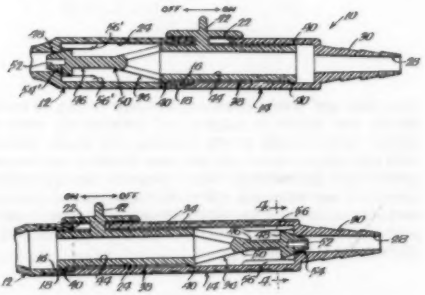
SURGICAL SUCTION PROBE WITH REVERSIBLE VALVE

Peter F. Bemis, Sheboygan, and Gerald W. Swart, Sheboygan Falls, both of Wis., assignors to Bemis Manufacturing Company, Sheboygan Falls, Wis.

Filed May 3, 1982, Ser. No. 374,103

Int. Cl.³ A61M 31/00

U.S. Cl. 604—48 **11 Claims**



1. An improved surgical suction probe comprising:

a tubular probe portion having an opening at one end for drawing flowable material therein,

a tubular handle portion, one end of which is joinecd to the other end of said probe portion and having an opposite end adapted to be operatively connected to an associated source of suction, said probe portion and said handle portion defining an internal bore when joined together,

one-piece valve means reciprocably disposed within said internal bore and movable between a flow position wherein flowable material is drawn in said opening and through said internal bore of said probe by said suction, and a non-flow position wherein said suction is blocked, flow through said probe being throttled when said valve means is between said flow and non-flow positions,

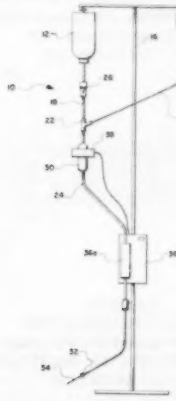
said valve means including a tubular body portion through which said flowable material flows as said material flows through said internal bore, a switch integral with said body portion and extending through a slot defined by said probe and handle portions for manipulation by a user to position said valve means within said internal bore, a pair of sealing lands integral with said body portion, respectively disposed on opposite sides of said switch portion and engaging the interior of said probe portion and handle portion and isolating said slot from the interior of said tubular body portion, and a stopper portion integral with said body portion including a frustoconical stopper plug spaced from said body portion adapted to sealingly engage a valve seat defined by one of said probe and handle portions when said valve means is in said non-flow position.

4,430,074

METHOD FOR THE INTRAVENOUS ADMINISTRATION OF PLURAL SOLUTIONS THROUGH A COMMON FLOW MONITORING STATION

William L. Mooring, Dudley, N.C., assignor to Samuel Ernest Douglass, Raleigh, N.C.

Filed Jul. 2, 1981, Ser. No. 280,089
Int. Cl.³ A61M 31/00
U.S. Cl. 604—49 1 Claim



1. An efficient method of automatically and sequentially intravenously administering two separate solutions to a patient with a Y-type IV set wherein during administration each solution is monitored by a single drip chamber control station disposed downstream from a Y-connecting point, thereby obviating the necessity of altering or changing the IV set and its control devices during the period in which the two solutions are being administered, said method comprising:

(a) elevating a first solution container containing a first solution above a second solution container containing a second solution;

(b) generating and forming a substantial intermediate pressure head between said solution containers and said monitoring station positioned below said Y-connecting point;

(c) said step of forming said substantial intermediate head pressure between said solution containers and said control station including the step of forming an elongated column of solution in first and second legs leading from said first and second solution containers, respectively, to said Y-connecting point;

(d) directing the first solution from the higher elevated first solution container to the first leg leading from said first solution container;

(e) directing a portion of said first solution into operative engagement with a check valve interposed intermediately within the second leg leading from said second solution container to said Y-connecting point so as to effectively close said check valve and to prevent flow of said second solution from said second solution container to said Y-connecting point;

(f) directing flow of said first solution from said Y-connecting point through the flow control station positioned in a delivery leg leading from said Y-connecting point such that the flow of said first solution is not monitored until the same moves downstream from said Y-connecting point;

(g) utilizing the substantial intermediate head pressure formed in said first leg between said first solution container and said control station to drive and force solution passing from said first solution container through said first leg into said control station;

(h) continuing to direct flow from said first solution container through said first leg and to said Y-connecting point and into said delivery leg where said solution passes through said control station formed therein, and continuing such delivery of said first solution until a selected volume of said first solution has been administered;

(i) deactuating said check valve in said second leg branch, and directing a stream of second solution from said second solution container through said second leg to the Y-connecting point;

(j) utilizing the substantial intermediate head pressure formed in said second leg between said second solution container and said control station to drive and force solution passing from said second solution container through said second leg into said control station; and

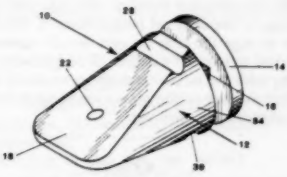
(k) directing said second solution from said Y-connecting point through said delivery leg and the flow monitoring station therein, wherein the flow of said second solution is monitored subsequently of the Y-connecting point but prior to reaching the patient.

4,430,075

DOSING TIP

Joseph J. Urban, Richboro, Pa., and Herbert E. Huckel, Penpack, N.J., assignors to Hoechst-Roussel Pharmaceuticals Inc., Somerville, N.J.

Filed Jul. 31, 1981, Ser. No. 288,823
Int. Cl.³ A61J 7/00
U.S. Cl. 604—77 8 Claims



1. A dosing tip for administering a dose of material to a host comprising:

(a) a body having a tapered end portion for insertion into the mouth of the host, said tapered end portion having at least one gripping means partially extending around the circumference of said tapered end portion for firmly engaging the host during the administration of the dose of material to the host and for disengaging the host by turning said body upon completion of the administration of the dose;

(b) an outlet in said tapered end portion for passing the dose of material from said tapered end portion to the host; and

(c) a conduit extending through said body for passing said dose through said body to said outlet.

4,430,076

COMBINED UTERINE INJECTOR AND MANIPULATIVE DEVICE

James H. Harris, 364 W. Lilburn Ave., Roseburg, Oreg. 97470

Filed Feb. 4, 1982, Ser. No. 345,777
Int. Cl.³ A61M 25/00
U.S. Cl. 604—96 8 Claims

1. A device insertable into the human uterus for examination purposes, said device comprising,

a catheter having an insertable end segment for passage into the cervical canal and fundus of the uterus,

an air line substantially coextensive with the catheter and including an air valve,

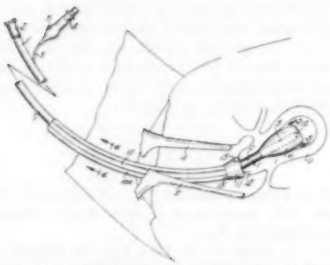
an elongate handle fixedly disposed about said catheter and serving to stiffen same,

a stop in place on one end of said handle and in a fixed relationship with the catheter and contactible during

catheter insertion with the external os of the cervix to thereby limit catheter insertion into the uterus, said stop defining one extremity of said catheter insertable end segment,

said end segment projecting beyond said stop being of a length approximately 6 cm to 6.25 cm to prevent the inserted end of the catheter from forceful contact with the uterine wall, and

an inflatable member disposed about said end segment of said



catheter and in communication with said air line, said inflatable member when inflated being expansible to engage the internal os of the cervix and adjacent uterine wall, said inflatable member upon inflation causing inward biasing of the catheter proportional to the extent of inflation to urge the stop on said handle against the external cervical os to exert a degree of compression on the cervix along with the inflatable member to attach the device in a secure manner to the uterus enabling positioning thereof for examination purposes.

4,430,077

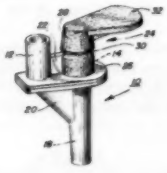
INJECTION SITE WITH TAMPER INDICATOR

Herbert Mittleman, Deerfield, and William L. Rush, Park Ridge, both of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Continuation of Ser. No. 195,885, Oct. 10, 1980, abandoned. This application Jun. 25, 1982, Ser. No. 392,413

Int. Cl.³ A61M *5/14*

U.S. Cl. 604—111 **3 Claims**



1. An injection site having a main body portion, a first inlet, a second inlet including a pierceable self-sealing member, and an outlet, the first inlet, second inlet and outlet being in fluid communication with the main body portion, the improvement comprising:

tamper indicating means connected to said second inlet, said tamper indicating means comprising a cap covering said second inlet and rendering said pierceable self-sealing member inaccessible, said cap comprising a first portion connected to said second inlet and a second portion separated from said first portion by a frangible section, a handle extending from said second portion and operable when actuated to break the second portion away from the first portion at said frangible section, with the first portion remaining connected to said second inlet and with the pierceable self-sealing member being accessible; said first portion comprising a ring member substantially encircling said second inlet, said second portion comprising a cup-shaped member and said frangible section comprising an annular thin section coupling said first portion to said second portion;

said second portion defining an opening adjacent said frangible section, said opening being defined in part by a wall which is above the plane of the top of said second inlet for enabling gas sterilization.

4,430,078

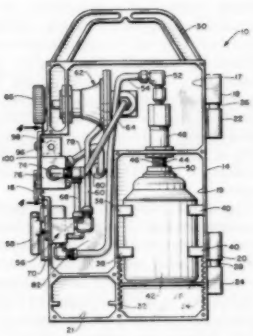
BLOOD INFUSION PUMP

Leland L. Sprague, 1810 Marisol Dr., Ventura, Calif. 93001

Filed Apr. 24, 1981, Ser. No. 257,325

Int. Cl.³ A61M *5/00*

U.S. Cl. 604—141 **9 Claims**



1. In combination with a blood bag, a blood infusion pump comprising:

a housing, said housing including a storage chamber for locating said blood bag;

pressure applying means for applying an evenly distributed force to said blood bag; and

pressure supply means for supplying a pressurized fluid through a conduit assembly to said pressure applying means, said pressure supply means comprising a container containing a quantity of pressurized fluid, said container being removable and replaceable within said housing, a valve assembly connected to said conduit assembly, said valve assembly to connect with said container to thereby supply the pressurized fluid from said container into said conduit assembly, said valve assembly being continuously spring biased into an airtight relationship with said container, said valve assembly being movable a limited amount in respect to said conduit assembly so as to positively engage in said airtight relationship with said container, whereby said pressurized fluid is conducted to said pressure applying means which causes blood to be discharged from said blood bag.

4,430,079
FLUID DISPENSING DEVICE

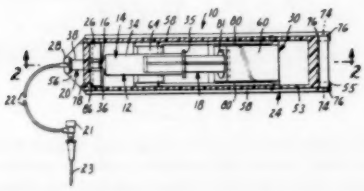
Gary A. Thill, Vadnais Heights, Minn., and Jerome E. Strand, St. Joseph Township, St. Croix County, Wis., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 144,614, Apr. 28, 1980, Pat. No. 4,298,000, which is a division of Ser. No. 958,678, Nov. 8, 1981, Pat. No. 4,202,333. This application Nov. 2, 1981, Ser. No. 317,257

The portion of the term of this patent subsequent to May 13, 1997, has been disclaimed.

Int. Cl.³ A61M *5/20*

U.S. Cl. 604—154 **9 Claims**



1. A fluid dispensing device adapted for engaging a fluid-filled syringe to dispense fluid from the syringe at a slow, steady rate, said syringe being of the type comprising an elongate housing including a tubular wall having an open end and an end wall having an outlet opening at the end of the tubular wall opposite its open end, and a plunger having one end portion positioned within and sealing against the inner surface of said tubular wall and an opposite end portion projecting from the open end of said tubular wall, with the fluid being within said tubular wall between said end wall and said plunger, said device comprising:

a hose assembly having first and second ends and defining a passageway between said ends, with at least a portion of said passageway being defined by a capillary tube having a diameter of less than about 0.02 cm and a length of at least 2 cm, and including a coupler at said first end adapted for releasably attaching said hose assembly to the housing of a said syringe with the outlet opening of the syringe communicating with said passageway;

a frame comprising support means adapted for engaging and supporting said coupler;

spring means adapted for applying a uniform force against the plunger of the syringe to cause fluid within said syringe to flow through said hose assembly; and

activating means for moving said spring means between a disengaged position spaced from the plunger of a said syringe attached to said coupler to afford insertion or removal of the syringe and said hose assembly, and an engaged position engaged with said plunger to apply said uniform force, said activating means including securing means for securing the syringe and the coupler of said hose assembly in said support means when said activating means positions said spring means in said engaged position.

4,430,080
SYRINGE ASSEMBLY WITH SNAP-FIT COMPONENTS

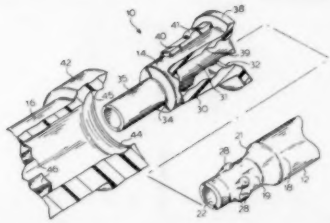
Richard J. Pasquini, Hackensack, N.J.; Harold Brown, Spring Valley, N.Y., and Alan Kostiuk, deceased, late of Byram Township, Sussex County, N.J. (by Barbara Kostiuk, administratrix), assignors to Becton, Dickinson and Company, Paramus, N.J.

Filed Jun. 9, 1982, Ser. No. 386,554

Int. Cl.³ A61M *5/00*

U.S. Cl. 604—240 **9 Claims**

1. In combination, a syringe said shield and a hub connected thereto, said syringe comprising a hollow barrel having a proximal end and a distal end, a slidable plunger in said barrel extending from the proximal end of said barrel, and a plurality of protuberances spaced around the outer periphery of the distal end of said barrel, said hub comprising a body with an open cavity therein and a cannula extending from said body in fluid communication with said cavity, said cavity being generally sized to receive the distal end of said barrel therein, said body having indentation means therein around the periphery



of said cavity with said protuberances being positioned therein, said combination further including a substantially hollow shield covering said cannula removably connected to said body, said hub including a plurality of protuberances spaced around its outer periphery and said shield including indentation means for receiving said hub protuberances therein, said hub protuberances and said shield indentation means being shaped to permit the ready removal of said shield from said hub.

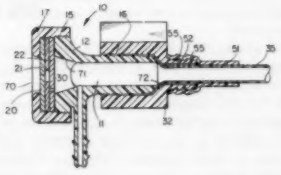
4,430,081
HEMOSTASIS SHEATH

Hans A. Timmermans, Bloomington, Ind., assignor to Cook, Inc., Bloomington, Ind.

Filed Jan. 6, 1981, Ser. No. 199,655

Int. Cl.³ A61M *25/00*

U.S. Cl. 604—256 **5 Claims**



1. A hemostasis cannula comprising:

A body having a passage therethrough adapted to receive a catheter; and first, second and third disc-like gaskets mounted in said passage, said first gasket having a slit therein, said second gasket having a hole therein and said third gasket having a flapper therein; said passage having one end adapted to be open to atmosphere and an opposite end adapted to be in communication with a patient's blood vessel; said first gasket being in contact with said second gasket and said second gasket being in contact with said third gasket; said first gasket being located toward said one end and said third gasket being located toward said other end with said second gasket between said first and third gaskets; said flapper being arranged and disposed to open only toward said other end; said second gasket being operable to maintain a sealing relationship with a catheter contained in said passage and, when a catheter is not contained in said passage, said first and second gaskets being operable to close said passage against flow into said blood vessel and said second and third gaskets being oper-

able to close said passage against flow out of said blood vessel.

4,430,082

HYPODERMIC SYRINGE ASSEMBLY

William Schwabacher, Wharton, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Jun. 25, 1982, Ser. No. 392,201
Int. Cl.³ A61M *5/00*
U.S. Cl. 604—263 **3 Claims**

1. An improved hypodermic syringe assembly of the type comprising:

(a) a medication chamber having an interior for containing liquid and first and second ends;

(b) a needle, attached to the first end of said medication chamber, through which liquid is expelled from said chamber;

(c) an elastomeric stopper, movably disposed within said medication chamber, movement of said stopper from said second end of said chamber toward said first end serving to expel liquid from said chamber through said needle;

(d) a first protective sleeve into which said needle is removably embedded; and

(e) a second protective sleeve which removably covers said first protective sleeve and, in turn, said needle, said second protective sleeve having means at one end thereof for attachment to said stopper, whereby said second protective sleeve and said stopper when so attached serve as a plunger;

the improvement in said syringe assembly comprising the provision in said second protective sleeve of flexible means for gripping said first protective sleeve, whereby simultaneous removal of both said first and second protective sleeves from said needle are effected by removing said second protective sleeve from over said needle while inwardly deflecting said flexible gripping means in order to grip said first protective sleeve.

4,430,083

INFUSION CATHETER

William Ganz, Los Angeles; Ronald J. Solar, Mission Viejo, and Clement Lieber, Yorba Linda, all of Calif., assignors to American Hospital Supply Corporation, Evanston, Ill.

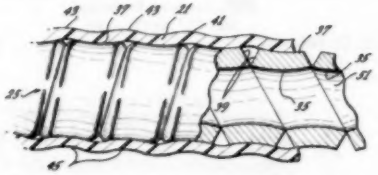
Filed Mar. 6, 1981, Ser. No. 241,291
Int. Cl.³ A61M *25/00*
U.S. Cl. 604—283 **5 Claims**

1. A catheter comprising:

an elongated flexible tube having a distal end, a peripheral wall, proximal and distal openings and an elongated passage extending generally axially through the tube between said openings;

a helically wound wire engaging the peripheral wall of the tube, said helically wound wire including a plurality of turns and providing increased column strength, said tube with said helically wound wire therein being flexible;

said wire having an inner surface, an outer surface, end faces, an axial cross-sectional dimension which extends axially of said passage between said end faces and a radial cross-sectional dimension which extends radially of said passage between said inner surface and said outer surface, said axial cross-sectional dimension being greater than said radial cross-sectional dimension; and



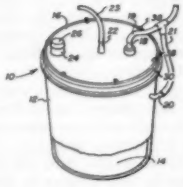
said helically wound wire having an outer peripheral surface and being wound and configured so as to provide said outer peripheral surface with an anticlastic curvature, said tube being in tight engagement with the outer peripheral surface of said helically wound wire and being deformed thereby so as to provide the outer peripheral surface of the tube with an uneven contour over at least a portion of the length of the tube.

4,430,084

METHOD FOR PRE-USE STORAGE OF A MEDICAL RECEPTACLE

David W. Deaton, Abilene, Tex., assignor to American Hospital Supply Corp., Evanston, Ill.

Division of Ser. No. 113,620, Jan. 21, 1980, Pat. No. 4,321,922.
This application Sep. 14, 1981, Ser. No. 301,526
Int. Cl.³ A61M *1/00*
U.S. Cl. 604—317 **6 Claims**



1. An assembly method for receptacles which receive fluids from the body of a patient, providing space saving pre-use storage of receptacle components, and fast, simple assembly at time of use, comprising:

stacking one within another a plurality of interchangeable re-usable rigid outer canisters for pre-use storage thereof;

stacking one within another a plurality of interchangeable disposable semi-rigid inner containers for pre-use storage thereof;

providing a plurality of interchangeable covers each having a first port means for fluid reception and a second port means for receiving a vacuum;

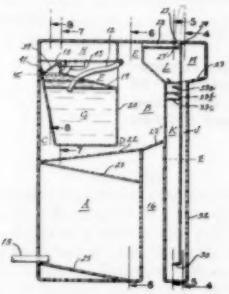
removing one of the inner containers and one of the canisters from pre-use storage and inserting the container within the canister;

covering the container and canister by pushing one of the covers thereon into coaction with the container;

applying a vacuum source to the second port means for creating a vacuum in the inner container; and

attaching a tube between the body of the patient and the first port means for drainage of fluids therefrom.

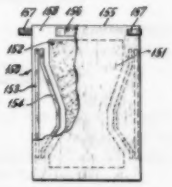
4,430,085
SAFETY SEAL CHEST DRAINAGE UNIT WITH TIPOVER SEAL CONTROL
Thomas S. Ahrens, 2731 Meramar Dr., St. Louis, Mo. 63129
Filed Mar. 3, 1982, Ser. No. 354,175
Int. Cl.³ A61M *1/00*
U.S. Cl. 604—321 **10 Claims**



1. A tip-safe underwater chest drainage unit for providing liquid sealed chest drainage, and for providing patient-protected drainage even when tipped over, said unit comprising an enclosure of unitary form constructed of synthetic resin material, said enclosure defining within it a liquid seal chamber, a chest drainage tube extending into said seal chamber, said seal chamber being configured for being normally substantially filled with liquid for submerging the end of said tube to provide atmospheric sealing thereof, a fluid collection chamber communicating with the seal chamber for receiving fluids via the seal chamber resulting from chest drainage through the drain tube, and characterized by equilibriation means in the enclosure for receiving fluid upon tipping over of the unit to maintain the drain tube end submerged in fluid at all times, including when tipped over, and to permit continued receiving of chest fluids even in a tipped-over condition of the unit, said equilibration means comprising at least a first equilibration chamber for receiving fluid from the seal chamber upon tipping over of the unit and for returning the received fluid to the liquid seal chamber upon returning of the unit from its tipped-over condition to an upright position, the drain tube end being positioned within the seal chamber for remaining below the surface of liquid in the seal chamber when fluid is received in said first equilibration chamber when the unit is tipped over.

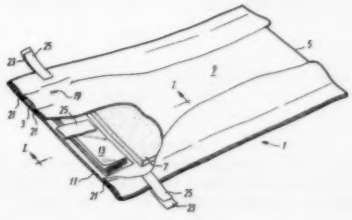
4,430,086
DISPOSABLE DIAPER WITH IMPROVED BODY CONFORMITY AND LIQUID RETENTION
Virginia L. Repke, Oak Forest, Ill., assignor to Johnson & Johnson Baby Products Company, New Brunswick, N.J.
Filed Jan. 8, 1979, Ser. No. 1,615
Int. Cl.³ A61F *13/16*
U.S. Cl. 604—385 **5 Claims**

1. A disposable diaper comprising: a moisture-permeable facing layer; an absorbent panel at one side of said facing layer, said absorbent panel being smaller than said facing layer so that side marginal portions of the facing layer extend outwardly beyond the side edges of said absorbent panel; a moisture-impervious backing layer at the side of said absorbent panel opposite said facing layer, said backing layer being larger than said absorbent panel so that side marginal portions of the backing layer extend outwardly beyond the side edges of said absorbent panel; means bonding said facing and backing layers to one another; and gathering means disposed in said side marginal portions, each of said gathering means including at least two spaced separate and distinct longitudinally extending, effectively elastic elements secured in each of said side marginal portions, said elastic elements being disposed in parallel relationship one to the other along only a portion of their



length, whereby said gathering means provide improved conformity about the legs of the wearer without undue application of pressure upon the skin of the wearer and each of said elastic elements applies a gathering force to a zone of a side marginal portion thereby defining more than one gasketing line at the leg of the wearer for improved liquid containment.

4,430,087
DISPOSABLE DIAPER
Rachel Azpiri, 11925 SW. 43rd St., Miami, Fla. 33175
Filed Feb. 5, 1982, Ser. No. 346,307
Int. Cl.³ A41F *13/02*
U.S. Cl. 604—385 **9 Claims**



1. In a disposable diaper having a folded generally rectangular pad of absorbent material positioned between an absorbent sheet and a flexible liquid-impervious backing sheet and a tubular storage bag formed of flexible, liquid-impervious sheet material, which is open at one end and closed at the other, affixed to one end of the diaper and dimensioned to receive the diaper after use when folded to the dimensions of the bag, the improvement wherein one end of the diaper is openable to expose the interior of the diaper, the bag is stored proximate the open end of and within the interior of the diaper, the bag is secured at its closed end to the interior of and proximate the open end of the diaper, and the open end of the diaper comprises means to retain the bag within the interior of the diaper prior to and during use of the diaper.

4,430,088

DIAPER WITH CUSHIONED ELASTIC LEG HOLD EDGES

Hamzeh Karami, Tilff, Belgium, assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Dec. 7, 1981, Ser. No. 328,296
Int. Cl.³ A41B *13/02*
U.S. Cl. 604—385 **2 Claims**

1. A disposable diaper comprising a backing sheet, an absorbent pad on said backing sheet, a top sheet overlying said absorbent pad, means securing said top sheet to said backing sheet with said pad therebetween and elasticized members entirely disposed within said pad.

4,430,089

PROCESS FOR IMPARTING FLAME RETARDANCY TO FABRICS

Madeline S. Toy, Palo Alto, and Roger S. Stringham, Woodside, both of Calif., assignors to Science Applications, Inc., La Jolla, Calif.

Filed Apr. 14, 1982, Ser. No. 368,405
Int. Cl.³ D06M *10/00, 1/22, 9/00*
U.S. Cl. 8—115.5 11 Claims

1. A process for imparting improved flame retardation, hand and hydrophobicity to a fibrous structure which comprises contacting said structure with a member selected from the group consisting of alkali and alkaline earth inorganic salts and halogenated organic monomers and then subjected the resulting structure to fluorination by a covalent fluoride in gaseous form.

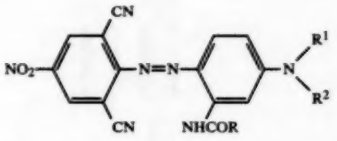
4,430,090

PROCESS FOR COLORING ORGANIC SOLVENTS, MINERAL OIL PRODUCTS, WAXES, PLASTICS AND SURFACE COATINGS WITH CYANO-NITRO-AMINO-AZO DYES

Ulrich Bühler, Schöneck; Reinhard Hähnle, Königstein; Joachim Ribka, Offenbach, and Helmut Richter, Kahl, all of Fed. Rep. of Germany, assignors to Cassella Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Aug. 19, 1982, Ser. No. 409,585
Claims priority, application Fed. Rep. of Germany, Aug. 27, 1981, 3133926
Int. Cl.³ C09B *29/08;* C10L *1/22;* C08K *5/23*
U.S. Cl. 8—508 13 Claims

1. The process for coloring a material selected from benzine, gasoline, petrol, diesel oil, fuel oil, waxes, polyvinyl chloride, polyethylene, polypropylene, polystyrene, polymers of styrene-butadiene mixtures or acrylonitrile-butadiene mixtures, lacquers, varnishes or paints which comprises mixing said material in liquid, molten or thermoplastic state at temperatures from 0° to 250° C. with a color producing amount of a dyestuff of the formula



wherein R is alkyl having 1 to 7 carbon atoms; R^1 is alkyl having 1 to 8 carbon atoms or alkenyl having 3 or 4 carbon atoms; R^2 is hydrogen, alkyl having 1 to 8 carbon atoms or alkenyl having 3 or 4 carbon atoms.

4,430,091

OXIDATION BASE DYE COMPOSITION AND METHOD OF DYEING THEREWITH

Clemens Streck, 12 Upper Loudon, Loudonville, N.Y. 12211

Filed May 19, 1982, Ser. No. 379,629
Int. Cl.³ D06P *3/80*
U.S. Cl. 8—523 18 Claims

1. A liquid dye composition comprising an oxidation base, acetic acid, and about 0.02 to about 0.3 mole, per mole of said oxidation base, of a C_{8-16} alkyl benzene sulfonic acid, in a substantialy anhydrous volatile organic solvent medium.

4,430,092

SCAVENGING ADDITIVE FOR LEADED AUTOMOTIVE FUEL AND METHOD OF USING SAME

Walter Rosenthal, 150 E. 74th St., New York, N.Y. 10021

Continuation of Ser. No. 217,044, Dec. 16, 1980, abandoned, which is a continuation of Ser. No. 966,593, Dec. 5, 1978, abandoned. This application Jan. 11, 1982, Ser. No. 338,556
Int. Cl.³ C10L *1/20*
U.S. Cl. 44—69 6 Claims

1. An anti-knocking composition comprising a tetra-alkyl lead compound and, as scavenging agent, tribromo methane.

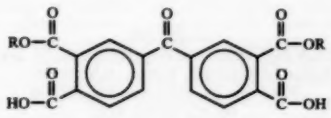
4,430,093

DIESEL FUEL ADDITIVE

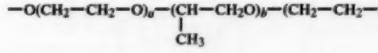
Robert H. Jenkins, Jr., Walden, and William M. Sweeney, Wappingers Falls, both of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Filed Sep. 27, 1982, Ser. No. 423,940
Int. Cl.³ C10L *1/18*
U.S. Cl. 44—70 8 Claims

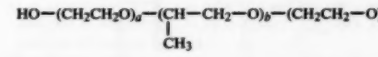
4. A distillate fuel oil mixture comprising a major proportion of a mineral oil distillate boiling in the range of 660°–675° F. at end point and a substantial proportion of a non-petroleum distillate, said fuel oil mixture characterized by having excessive deposit forming properties, and containing an effective amount of a deposit inhibiting additive having the following structure:



wherein R is selected from the group consisting of:



and



wherein a has a value from 3–185 and b has a value from 10–300 and c has a value from 3–185.

4,430,094

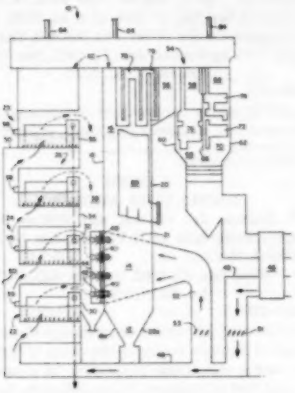
VAPOR GENERATING SYSTEM HAVING A PLURALITY OF INTEGRALLY FORMED GASIFIERS EXTENDING TO ONE SIDE OF AN UPRIGHT WALL OF THE GENERATOR

Walter P. Gorzegno, Morristown, N.J., assignor to Foster Wheeler Energy Corporation, Livingston, N.J.

Filed Dec. 21, 1981, Ser. No. 332,632
Int. Cl.³ C10K *3/00*
U.S. Cl. 48—76 12 Claims

1. An integral generator/gasifier system comprising a vapor generator including a furnace section formed by four upright walls, a plurality of openings formed in at least one of said walls, a plurality of vertically spaced gasifiers extending adjacent said one wall and surrounding said openings, so that the respective interiors of said gasifiers communicate with said openings, means for introducing fuel to each gasifier, means in each gasifier for supporting a bed of adsorbent material for the sulfur generated as a result of the gasification of said fuel, and means for passing air through said bed of adsorbent material to fluidize said material so that, upon gasification of said fuel, a

substantially sulfur-free product gas is produced which passes from said gasifier, through said openings and into said furnace



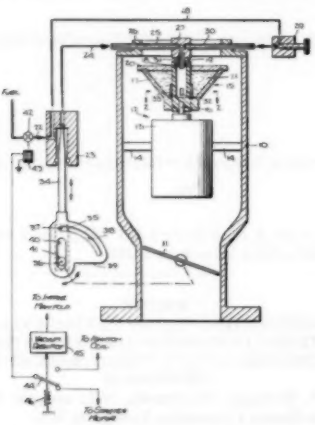
section, such that combustion of the gas and unreacted carbon occurs.

4,430,095

GASEOUS MIXTURE FROM LIQUID FUEL AND AIR

Jack J. Gilbert, 3 River Rd., Suffern, N.Y. 10901

Filed Apr. 14, 1982, Ser. No. 368,102
Int. Cl.³ F02M 9/12
U.S. Cl. 48—180 C 21 Claims



1. A device for supplying a flow of a gaseous mixture of fuel and air to a combustion apparatus, the device comprising:

a housing having an air intake passage with an inlet end communicating with the atmosphere and an outlet end;

fuel chamber positioned within the intake passage in spaced relation to the passage wall to permit air to flow through the intake passage from the inlet end, around the fuel chamber, to the outlet end, said fuel chamber having an axis of symmetry and a microporous peripheral wall of a rigid material having a pore size of about 4.0 microns, the microporous wall encircling said axis, and said fuel chamber being enclosed so that essentially no air flowing through the intake passage can enter the fuel chamber;

means for supporting the fuel chamber for rotation about its axis of symmetry within the intake passage;

a conduit for delivering liquid fuel to the fuel chamber via said supporting means; and

means for rotating the fuel chamber about said axis of rotation to force the fuel centrifugally through said microporous wall, whereby the fuel emerges from the microporous wall in substantially gaseous form and with a velocity component tangential to said porous wall to assure thorough mixing with air flowing through the intake passage around the fuel chamber.

14. A method for providing a gaseous mixture of fuel and air to a combustion apparatus, the method comprising:

delivering a flow of air to a combustion apparatus via an intake passage;

delivering a flow of liquid fuel to a fuel chamber located inside the intake passage, the fuel chamber being completely enclosed such that all of said flow of air passes around the chamber without entering the chamber; and

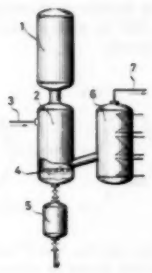
rotating the fuel chamber to urge the fuel by centrifugal force through a peripheral microporous wall of the chamber concentric with the axis of rotation.

4,430,096

PROCESS FOR THE PRODUCTION OF GAS MIXTURES CONTAINING HYDROGEN AND CARBON MONOXIDE VIA THE ENDOTHERMIC PARTIAL OXIDATION OF ORGANIC COMPOUNDS

Friedrich Schnur, Oberhausen; Boy Cornils, Dinslaken; Josef Hibbel, Oberhausen, and Bern-Hard Lieder, Bottrop, all of Fed. Rep. of Germany, assignors to Ruhrchemie Aktiengesellschaft, Oberhausen, Fed. Rep. of Germany

Continuation of Ser. No. 42,750, May 29, 1979, abandoned. This application Jun. 12, 1981, Ser. No. 272,857
Claims priority, application Fed. Rep. of Germany, May 26, 1978, 2822862
Int. Cl.³ C10J 3/46, 3/54
U.S. Cl. 48—206 12 Claims



1. A process for the production of gas mixtures containing hydrogen and carbon monoxide which comprises:

A. gasifying an ash-forming solid carbonaceous fuel with oxygen or an oxygen containing gas mixture in the presence of steam in a gasifier; and

B. removing liquid ash from said gasifier by entraining it in the gaseous mixture formed in said gasifier and feeding the gasified products of step A including liquid ash contained therein to a vessel into which a partially oxidizable organic compound is fed together with steam and/or carbon dioxide and therein contacting the gaseous effluent and liquid ash with steam and/or carbon dioxide introduced with said organic compound while maintaining said vessel at a temperature of 900° to 1600° C. at a pressure up to 200 bar; said contacting resulting in the cracking of the organic compound and causing the liquid ash to deposit in the solid state and recovering said ash in the solid state,

and wherein said vessel contains a water bath located below the location where said contacting occurs to recover the solidified ash from the gaseous effluent.

4,430,097

LITHIUM ALUMINATES FOR SEPARATING HYDROCARBONS

John L. Burba, III, Angleton, Tex., assignor to The Dow Chemical Co., Midland, Mich.

Continuation-in-part of Ser. No. 217,613, Dec. 18, 1980, Pat. No. 4,321,065. This application Mar. 22, 1982, Ser. No. 360,702
The portion of the term of this patent subsequent to Mar. 23, 1999, has been disclaimed.
Int. Cl.³ B01D *15/08*
U.S. Cl. 55—67 **10 Claims**

10. A process for separating a hydrocarbon mixture into components, said process comprising

providing a vessel or column containing particulate crystalline $LiX.2Al(OH)_3.nH_2O$, where X is a monovalent, divalent, or trivalent anion and n is an integer having a numerical value in the range of about 1 to about 6,

said vessel or column being adapted for the flow of gas-entrained fluids therethrough,

entraining said hydrocarbon mixture in an inert gas carrier,

passing the so-entrained mixture through the vessel, and

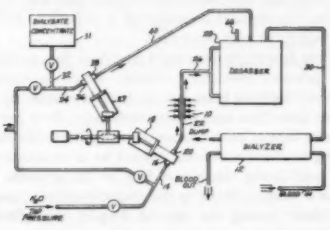
collecting the effluent from the vessel in component fractions.

4,430,098

APPARATUS FOR DEGASSING HEMODIALYSIS LIQUID AND THE LIKE

Donald B. Bowman, 7635 NW. McDonald Cir.; Charles J. Filz, and James G. Osborn, both of 1930 SE. Stone St., all of Corvallis, Oreg. 97330

Division of Ser. No. 669,903, Mar. 24, 1976, Pat. No. 4,325,715. This application Aug. 25, 1980, Ser. No. 181,107
Int. Cl.³ B01D *31/00*
U.S. Cl. 55—191 **10 Claims**



1. Apparatus for removing gases from a hemodialysis liquid prior to introduction of such liquid into a hemodialyzer, said apparatus comprising:

wall means of filter material that is not wetted by liquid and which includes pores which normally remain open for passage of gas, defining a tubular coil having two ends;

means for delivering a gas-containing hemodialysis liquid into the interior of said coil, through both ends of said coil, and against said wall means under sufficient pressure to force said liquid through said wall means, said gas being freed from the liquid as it passes through the wall means; and

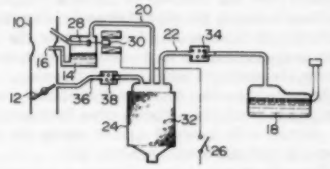
means for separating the freed gas from the hemodialysis liquid downstream of said wall means.

4,430,099

VAPORIZED FUEL ADSORBING CANISTER

Syozo Yanagisawa, Ibaraki, and Yuichi Tobita, Katsuta, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 17, 1981, Ser. No. 274,678
Claims priority, application Japan, Jun. 18, 1980, 55-83214; Aug. 1, 1980, 55-108443[U]; Sep. 5, 1980, 55-122382; Sep. 22, 1980, 55-133809[U]
Int. Cl.³ B01D *50/00*
U.S. Cl. 55—316 **17 Claims**



1. A vaporized fuel adsorbing canister, adapted to arrest oil or fat material contained in the fuel, comprising:

(a) a hollow body formed with a first opening at one end and a second opening at the other end;

(b) a first filter member mounted in said first opening and a second filter member mounted in said second opening;

(c) a charge of vaporized fuel adsorbing agent contained in said hollow body in a space defined between said first filter member and said second filter member;

(d) a first grid formed with a multiplicity of vaporized fuel permeating openings located adjacent said first filter member on a side thereof opposite said charge of vaporized fuel adsorbing agent and a second grid formed with a multiplicity of air permeating openings located adjacent said second filter member on a side thereof opposite said charge of vaporized fuel adsorbing agent;

(e) a cover affixed to said hollow body in closing relation to said first opening to provide a cover to said first filter member and said first grid;

(f) a vaporized fuel inlet port opening in said cover and adapted to communicate via a rubber tube with a portion of a fuel tank above its liquid level;

(g) a vaporized fuel outlet port opening in said cover and adapted to communicate via a rubber tube with a suction conduit of an engine; and

(h) a porous material member mounted between said first grid and said vaporized fuel inlet port, said porous material member being formed of a porous material that can arrest an oil or fat material contained in the fuel introduced into the canister, said porous material member being formed with, in addition to the pores of the porous material, more than one vaporized fuel permeating opening to which is led a fuel lowing along an inner wall surface of said cover, each said more than one vaporized fuel permeating opening having an extent such that a hole is formed through the porous material member.

4,430,100

SIDE STREAM SEPARATION SYSTEM FOR MECHANICAL COLLECTORS AND METHOD OF CONSTRUCTING SAME

Philip T. Cardo, 176 Forestwood Dr., Northfield, Ohio 44067

Filed Jun. 5, 1981, Ser. No. 270,969
Int. Cl.³ B01D *45/12*
U.S. Cl. 55—344 **5 Claims**

1. A method of modifying an existing mechanical separator to permit extraction therefrom of a side stream flow of fine-particulate-laden effluent gases,

wherein the mechanical separator is of the type including an outer housing defining an enclosure, a collecting tube sheet extending through the enclosure and dividing the

enclosure into upper and lower chambers, and a plurality of collector tubes arranged in an array in the lower chamber and having upper portions opening through the collecting tube sheet for receiving particulate-containing effluent gases admitted to the upper chamber, each of the collector tubes being constructed to establish a cyclonic flow of gases passing therethrough for projecting particulate matter outwardly while utilizing a vortex effect to assist in reversing the direction of flow of cleaned gas and exhausting the cleaned gas from the tube along a path different from that followed by the separated particulate,

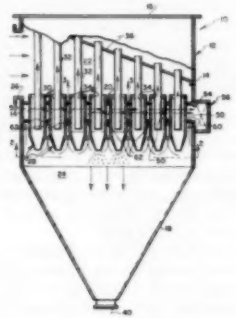
the method including the steps of disposing sheet-like means in the lower chamber at a location about the collector tubes in spaced relation to the collector sheet to define a plenum therebetween and within said housing,

providing the sheet-like means with a plurality of pickup openings between the collector tubes for communicating the plenum with locations spaced among the collector tubes and with the lower chamber, and

providing exhaust means for withdrawing particulate-laden effluent gases from the plenum and for ducting such gases to separator means for removing particulate matter from such gases.

4. A mechanical separator for separating particulate matter from effluent gas within which the particulate matter is entrained, comprising:

(a) housing means defining an upstanding housing;



(b) first divider means extending substantially horizontally through the housing and dividing the housing into upper and lower chambers;

(c) the housing means including inlet structure defining an inlet for admitting particulate-laden effluent gases into the upper chamber, and outlet structure defining an outlet for discharging cleaned gas from the lower chamber;

(d) collector means including a plurality of collector tubes supported within the housing for receiving particulate-laden effluent gases admitted into the upper chamber, for discharging particulate from such gases into the lower chamber; and for discharging substantially cleaned gas toward said outlet structure,

(e) localized extraction means for withdrawing a portion of the particulate-laden effluent gases from selected locations in the lower chamber among the collector tubes, the extraction means including:

(i) second sheet-like divider means extending through the housing at a location spaced below the first divider means;

(ii) the first and second divider means and postions of the housing means defining a plenum about the collector tubes;

(iii) a plurality of pickup openings communicating the plenum with said selected locations; and

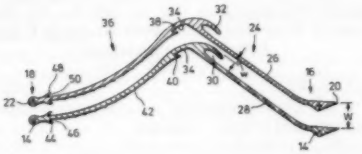
(iv) plenum outlet means, whereby effluent gases may be may be drawn through the pickup openings and into the plenum before being ducted from the plenum for treatment to separate particulate from such gases.

4,430,101

SEPARATOR BLADES FOR MIST ELIMINATORS

Richard Sixsmith, Mississauga, Canada, assignor to Plasticair Systems 442829 Ontario Inc., Mississauga, Canada

Filed Dec. 31, 1981, Ser. No. 336,528
Int. Cl.³ B01D *45/08*
U.S. Cl. 55—440 **14 Claims**



1. A separator blade assembly for a mist eliminator comprising:

a plurality of separator blades disposed parallel to one another to form a respective gas flow passage between each immediately adjacent pair of blades,

each blade consisting of an elongated body having a front face and a rear face, whereby in a mist eliminator containing the blade assembly each gas flow passage is formed between a respective blade front face and the facing rear face of the immediately adjacent blade,

each blade comprising in the order stated in the direction of gas flow in the respective gas flow passages at least an entry part including a leading edge, a first droplet impingement part, a primary collection channel, a blade junction, a second droplet impingement part, and an exit part including a trailing edge,

each blade entry part being inclined at an angle to the subsequent first droplet impingement part of the blade to cause a corresponding change in direction in the respective flow passages, the portion of the front face of the first droplet impingement part between the entry part and the primary collection channel constituting a respective first droplet impingement part front face,

each first droplet impingement part front face terminating at the primary collection channel which is formed by a channel-forming hook-like projection protruding from the blade front face into the respective gas flow passage,

the outer face of each channel-forming hook-like projection being outwardly convex curved so as to cooperate with the said facing blade rear face of the adjacent blade to form a venturi throat in the respective flow passage,

each blade having the second droplet impingement part inclined at an angle to the first impingement part at the said blade junction so as to cause a corresponding change in direction in the respective flow passage at the said junction downstream of the respective venturi throat, the rear face of the second impingement part constituting a respective second droplet impingement part rear face,

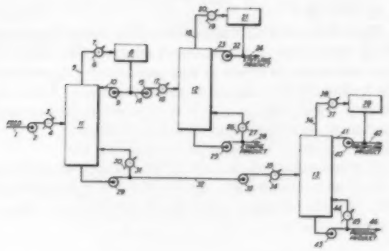
the second droplet impingement part having a portion of its rear face immediately following the said blade junction disposed so as to be approximately at right angles to the direction of gas flow through the respective venturi throat for corresponding impingement of the gas flow thereon,

the said second droplet impingement part rear face portion terminating in a secondary droplet collection channel formed by a channel-forming hook-like projection protruding from the rear face into the respective flow passage.

4,430,102
FRACTIONAL DISTILLATION OF C_2/C_3 HYDROCARBONS AT OPTIMUM PRESSURES

Daniel W. Tedder, Marietta, Ga., assignor to Georgia Tech Research Institute, Atlanta, Ga.

Continuation of Ser. No. 299,623, Sep. 4, 1981, abandoned. This application Nov. 3, 1982, Ser. No. 438,935
Int. Cl.³ F25J 3/02
U.S. Cl. 62—24 **1 Claim**



1. Method of optimizing the expense of the recovery of C_2/C_3 hydrocarbons from a fluid mixture through fractional distillation comprising operating a system of towers in which each tower receives a single feed and produces two effluents and maintaining the pressure of each tower within ±15 psia of the pressure calculated from formulae:

$$\log_e (P^*) = 2.677 - \frac{309.4}{T_{FB}} + \frac{1147.6}{T_{\phi B}} + \frac{1087.4}{T_{BD}}$$

wherein:

P^* = the pressure of each tower in psia

T_{FB} = tower feed mixture bubble point temperature (° R) evaluated at 485 psia

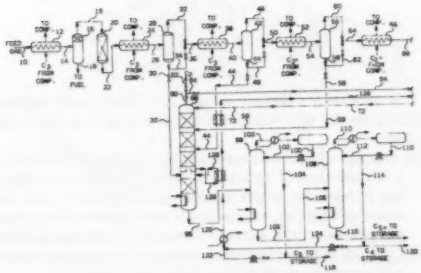
$T_{\phi B}$ = tower overhead product mixture bubble point temperature (° R) evaluated at 485 psia

T_{BD} = tower bottom product mixture dew point temperature (° R) evaluated at 485 psia.

4,430,103
CRYOGENIC RECOVERY OF LPG FROM NATURAL GAS

Michael L. Gray, and William A. McClintock, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Feb. 24, 1982, Ser. No. 351,728
Int. Cl.³ F25J 3/02
U.S. Cl. 62—28 **18 Claims**



1. A process for cryogenically liquifying methane and separating C_2, C_3, C_4 and C_5 and higher molecular weight hydrocarbons from a natural gas feed predominating in methane and containing significant amounts of C_2, C_3, C_4 and C_5 and higher molecular weight hydrocarbons, comprising:

(a) cooling said natural gas feed in at least one first cooling stage to a temperature sufficient to liquify at least a portion of said C_2, C_3, C_4 and C_5 and higher molecular weight hydrocarbons and to liquify said methane;

(b) separating at least one first liquid phase portion, predominating in C_2, C_3, C_4 and C_5 and higher molecular weight hydrocarbons, from the thus cooled natural gas feed, in at least one first separation step;

(c) further separating said at least one first liquid phase portion, predominating in C_2, C_3, C_4 and C_5 and higher molecular weight hydrocarbons, in at least one second separation step, to recover a third liquid phase fraction predominating in C_5 and higher molecular weight hydrocarbons, as a product of the process, and at least one fourth liquid phase portion, predominating in C_2, C_3, and C_4 hydrocarbons;

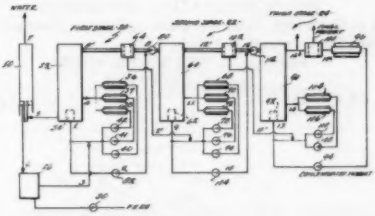
(d) recycling one portion of said at least one fourth liquid phase portion comprising a stream of at least part of one of (1) said C_2, C_3 and C_4 hydrocarbons, (2) said C_2, and C_3 hydrocarbons and (3) said C_3 and C_4 hydrocarbons, in its uncompressed liquid phase, to the thus liquified methane; and

(e) recovering the remaining portion of said at least one fourth liquid phase portion, which is not thus recycled to the thus liquified methane, as at least one product of the process.

4,430,104
MULTI-STAGE COUNTERCURRENT CONCENTRATING SYSTEM AND METHOD AND SEPARATOR

Wilhelmus H. J. M. Van Pelt, and Jacobus P. Roodenrijs, both of 's-Hertogenbosch, Netherlands, assignors to Grasso's Koniklijke Machine Fabrieken, N.V., 's-Hertogenbosch, Netherlands

Division of Ser. No. 202,429, Oct. 30, 1980, Pat. No. 4,316,368. This application Jul. 19, 1982, Ser. No. 399,867
Int. Cl.³ B01D 9/04
U.S. Cl. 62—123 **13 Claims**



1. Apparatus for separating solids and liquids in a slurry comprising:

a vessel having a first inlet, a first outlet opposite said first inlet for solids which are separated and a second outlet for liquid which is separated;

a filter mounted in said vessel;

means for supplying from said first inlet at least liquid in a direction to contact said filter in a plane substantially tangential to the surface of said filter to pass along said surface and supplying said slurry to the filter so that at least a portion of said liquid passes therethrough to said second outlet and said solid accumulates on the surface of said filter; and

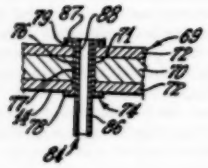
means for continuously removing said solids from said filter surface adjacent said first outlet so that a portion of said liquid from said first inlet transports the removed solids to said first outlet.

4,430,105

METHOD AND APPARATUS FOR FORMING GLASS FIBERS

Mohinder S. Bhatti, and Alfred Marzocchi, both of Newark, Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Continuation of Ser. No. 200,676, Oct. 27, 1980, Pat. No. 4,342,577. This application May 14, 1982, Ser. No. 378,027
The portion of the term of this patent subsequent to Aug. 3, 1999, has been disclaimed.
Int. Cl.³ C03B *37/025*
U.S. Cl. 65—1 13 Claims



1. A feeder for supplying streams of molten glass to be attenuated into filaments comprising:

a plurality of layers of material wherein one of said layers is a refractory metal and another of said layers is an oxygen impervious, precious metal, said plurality of layers being initimately bonded together by the application of isostatic pressure and heat to form a unitary laminate, said laminate having a plurality of apertures extending therethrough; and

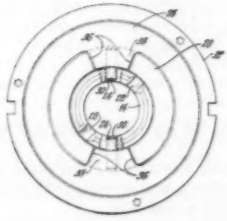
a plurality of elements bonded to the laminate and positioned in said apertures to prevent the oxidation of the refractory metal at elevated temperatures, said elements having an orifice adapted to permit the molten glass to flow therethrough to provide said streams of molten glass.

4,430,106

SPINNER ROTATING APPARATUS

Paul A. Goodridge, Granville, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Apr. 5, 1982, Ser. No. 365,703
Int. Cl.³ C03B *37/04*
U.S. Cl. 65—15 3 Claims



1. Apparatus for rotating a spinner for centrifuging mineral fibers from molten mineral material comprising a shaft on which said spinner is mounted, a pin slot in said shaft having an end portion, a pin mounted for engaging said pin slot in said shaft and applying torque to said shaft, a pin carrier for holding said pin and applying rotational force thereto, means for urging said pin carrier, and thus said pin, axially with respect to said shaft, thereby forcing said pin into fixed contact with said end portion of said pin slot, and means, separate from said means for urging, for rotating said pin carrier.

4,430,107

METHOD FOR MAKING SHAPED FOAM GLASS BODIES

Heinz Dennert, Trosdorfer Weg 6, 8602 Bischberg; Hans V. Dennert, Mozartweg 1, 8602 Schlüsselfeld, both of Fed. Rep. of Germany, and Alois Seidl, Lam, Fed. Rep. of Germany, assignors to Heinz Dennert, Bischberg; Hans Veit Dennert, Schlüsselfeld, Fed. Rep. of Germany

Filed Apr. 12, 1982, Ser. No. 367,790
Int. Cl.³ C03B *19/08*
U.S. Cl. 65—22 12 Claims

1. Method for making shaped foam glass bodies from ground glass by hydrolysis in a hydrolysis mixture with solid alkali silicate and water, in which at least one foaming agent is added to the hydrolysis mixture, or to a resulting slip to form a foam producing mass, and in which the foam producing mass is foamed at an increased temperature, comprising:

mixing a mixture of two types of glass namely

(a) glass containing more than 16% by weight alkali oxide,

(b) glass containing less than 16% by weight alkali oxide,

95% of each having a grain size of less than 0.1 mm, at a weight ratio of

$a:b = 1:1.5$ to $1:20$

with water at temperatures from 50° to 100° C. until the mixture thickens, the ratio of water to total solids being 1:1.4 to 2.5, and

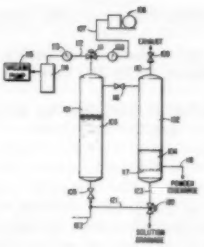
processing further the resulting mass into shaped foam glass bodies.

4,430,108

METHOD FOR MAKING FOAM GLASS FROM DIATOMACEOUS EARTH AND FLY ASH

Hamid Hojaji, Kensington, Md.; Pedro B. de Macedo, 6100 Highboro Dr., Bethesda, Md. 20817, and Theodore A. Litovitz, 3022 Friends Rd., Annapolis, Md. 21401, assignors to Pedro Buarque de Macedo, Bethesda and Theodore Aaron Litovitz, Annapolis, both of, Md.

Continuation-in-part of Ser. No. 311,317, Oct. 14, 1981, abandoned. This application Sep. 14, 1982, Ser. No. 418,078
Int. Cl.³ C03B *19/08*
U.S. Cl. 65—22 54 Claims



1. A process for making a foam glass body from diatomaceous earth, fly ash, volcanic ash and mixtures thereof comprising:

(a) impregnating diatomaceous earth, fly ash, volcanic ash or a mixture thereof with an impregnating solution comprising at least one water soluble glass former, at least one water soluble flux, at least one water soluble carbohydrate gas generator, and water to form an impregnated material;

(b) heating the impregnated material above the glass transition temperature of the impregnated material;

(c) cooling the impregnated material;

(d) pulverizing the cooled impregnated material; and

(e) heating the pulverized impregnated material in an oxidizing atmosphere to a sufficient temperature to cause foam-

ing of the impregnated material thereof thereby forming a foam glass body.

4,430,109

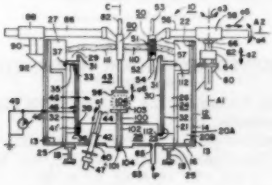
METHOD OF REGULATING FUEL AND AIR FLOW TO A GLASS MELTING FURNACE

Ronald W. Palmquist, Horseheads, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Division of Ser. No. 243,811, Mar. 16, 1981, Pat. No. 4,366,571. This application Sep. 7, 1982, Ser. No. 415,405

Int. Cl.³ C03B *5/00*

U.S. Cl. 65—32 **3 Claims**



1. A method of operating a furnace having an oxidizable protective liner wherein batch materials containing within interstices thereof trapped deleterious gaseous constituents are fusible into a mass of molten thermoplastic material within said furnace, the method comprising the steps of: depositing said batch materials within said furnace, firing said furnace with a mixture of fossil fuel and air, regulating said air to fuel mixture to marginally stoichiometric conditions such that the fuel is fired under a neutral condition relative to oxidation thereby protecting the oxidizable liner from oxidation due to combustion air and the gaseous materials trapped between the interstices of said batch material.

4,430,110

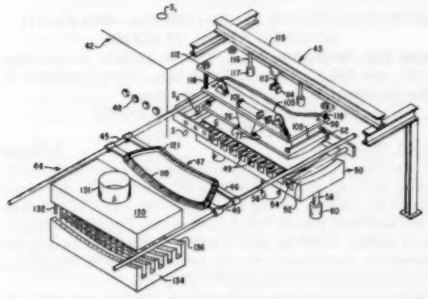
SHAPING SHEETS OF GLASS OR OTHER DEFORMABLE MATERIAL TO A COMPOUND CURVATURE

Robert G. Frank, Murrysville; George R. Claassen, New Kensington; John J. Ewing, Tarentum, and Michael T. Fecik, Pittsburgh, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jul. 28, 1982, Ser. No. 402,670

Int. Cl.³ C03B *23/035*

U.S. Cl. 65—104 **11 Claims**



1. A deformable mold for use in shaping sheets composed of glass or other deformable material to a compound shape comprising a first bend component about a first axis and a second bend component about a second axis transverse to said first axis comprising means adapted to connect said mold to a source of vacuum, an upper flexible sheet of fluid-impervious material, an apertured lower flexible sheet of fluid-impervious material, flexible spacer means between said upper flexible sheet and said lower flexible sheet constructed and arranged to hold said lower flexible sheet with a convex downward configuration in elevation about the first axis of said mold and in an essentially flat plane about said second axis when said flexible sheets are clamped together in unstressed relation along a common dimension, and means to distort said mold about its second axis from a flat configuration to a desired curved configuration so that when vacuum is applied to said mold a hot sheet of deformable hot material is held against said apertured, lower flexible sheet by vacuum and when said mold is deformed with vacuum applied, said hot sheet is deformed in engagement with said deforming mold.

9. A method of shaping a sheet of deformable material to a compound curvature comprising a longitudinal bend component about a transverse axis and a transverse bend component about a longitudinal axis comprising engaging said sheet while it is hot enough to be deformed and while it is shaped transversely about its longitudinal axis to said transverse bend component with a deformable vacuum mold having a transversely curved configuration conforming to that of said sheet undergoing shaping by vacuum, and while holding said hot deformable sheet against said deformable mold by vacuum, distorting said mold about its transverse axis into a shape approximating said longitudinal bend component while said sheet is still hot enough to be deformed, whereby said sheet develops a compound bend comprising said longitudinal bend component and a transverse bend component.

4,430,111

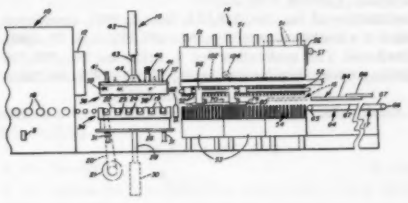
METHOD AND APPARATUS TO REMOVE SHARPLY BENT, TEMPERED GLASS SHEETS FROM A COOLING STATION

George R. Claassen, New Kensington, and John J. Ewing, Tarentum, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jul. 28, 1982, Ser. No. 402,672

Int. Cl.³ C03B *23/035*

U.S. Cl. 65—114 **7 Claims**



1. A method of removing a sharply bent, tempered glass sheet from a cooling station where said glass sheet is engaged against a ring-like member while blasts of tempering medium are applied from opposed, spaced pressure sources against the opposite major surfaces of said supported glass sheet from spaced opposed plenum chambers at a rate sufficient to impart at least a partial temper in the glass, and interposing elongated arms between one of said plenum chambers and the major surface of said bent, tempered glass sheet opposite the major surface engaging said ring-like member, characterized by moving one of said pressure sources away from the other of said pressure sources to cause a net flow of tempering medium to provide sufficient force in a direction such as to disengage said bent, tempered glass sheet from said ring-like member and to engage said bent, tempered glass sheet against said elongated arms, moving said arms beyond said one of said plenum chambers with said bent, tempered glass sheet engaged thereagainst in a downstream direction toward an unloading conveyor, tilting the leading edge of said bent, tempered glass sheet away from said elongated arms to transfer said bent, tempered glass

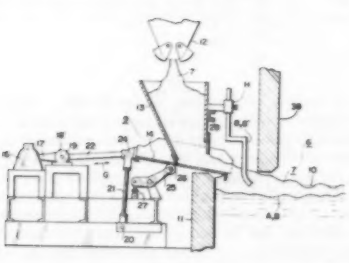
sheet gently from said elongated arms to an upper run of said unloading conveyor while preventing said bent, tempered glass sheet from falling uncontrollably from said elongated arms to avoid impacting said glass sheet sharply onto said upper run.

5. Apparatus for transferring a sharply bent, tempered glass sheet gently from a ring-like member to the upper run of an unloading conveyor comprising a cooling station having an upper plenum chamber and a lower plenum chamber, means to convey said ring-like member supporting said glass sheet through said cooling station between said plenum chambers, means to deliver tempering medium under pressure to said plenum chambers for delivery against the opposite major surfaces of said glass sheet when the latter is supported on said ring-like member, elongated arms adapted for movement along a path at a level between the level of the path taken by said ring-like member and a normal position occupied by said upper plenum chamber between an upstream position between said plenum chambers and a downstream position downstream of said cooling station, means to provide a net upward force of tempering medium in said upstream position between said plenum chambers when said elongated arms occupy said upstream position to disengage said bent, tempered glass sheet from said ring-like member and to engage said bent, tempered glass sheet against said elongated arms, means to lift the upper plenum chamber away from said elongated arms, means to move said elongated arms to said downstream position with said bent, tempered glass sheet engaged thereagainst, means to lower said upper plenum chamber to said normal position, and an unloading conveyor located downstream of said cooling station, said unloading conveyor having an upper run occupying a position at a level slightly below the level occupied by said elongated arms, whereby, when said bent, tempered glass sheet moves into said downstream position, it tilts with its leading edge moving downward to transfer gently from engagement with said elongated arms into engagement with said upper run.

4,430,112
SHEET GLASS PRODUCING APPARATUS

Kazuyuki Tanaka, Matsusaka, Japan, assignor to Central Glass Company, Limited, Ube, Japan

Continuation of Ser. No. 318,692, Nov. 6, 1981, abandoned, which is a continuation of Ser. No. 142,151, Apr. 21, 1980, abandoned. This application Jul. 8, 1982, Ser. No. 396,326
Claims priority, application Japan, May 1, 1979, 54-53628
Int. Cl.³ C03B *3/00, 5/22*
U.S. Cl. 65—335 **6 Claims**



1. An apparatus for producing sheet glass, comprising:
an oblong glass melting tank for molten glass;
said tank having heating means arranged such that said tank has its zone of highest temperature along the longitudinal axis of said tank;
said tank having an extension provided at its axial one end terminating in a backwall;
material feeding means located at said backwall for feeding raw materials of glass onto a surface of molten glass in said extension of said tank so that the heap of raw materials riding on the surface of molten glass is forced to move in a downstream direction away from said backwall;
a wall member located in the area of said extension and spaced from said backwall and defining with said backwall a dog house section;
an obstruction member means associated with said material feeding means at said dog house section and projecting into said heap of raw materials entirely within said dog house section for imparting flow resistance to said heap of raw materials where the temperature is less than the temperature in the glass melting tank, the projecting end or ends of said obstruction member means being embedded in the heap of the raw material only at a position close to the laterally central portion of said tank.

4,430,113
PLANT GROWTH REGULATOR COMPOSITIONS AND METHOD

Jack R. Miller, Greenfield, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 148,115, May 9, 1980, abandoned. This application Aug. 24, 1981, Ser. No. 295,437
Int. Cl.³ A01N *43/54, 41/00*
U.S. Cl. 71—92 **6 Claims**

1. A composition suitable for controlling seedhead formation in turfgrasses consisting essentially of about 0.031 to about 0.125 part by weight of mefluidide and about 0.5 to about 2.0 parts by weight of α-(1-methylethyl)-α-[4-(trifluoromethoxy)-phenyl]-5-pyrimidinemethanol, or a nonphytotoxic acid addition salt thereof.

4,430,114
2,6-DINITROANILINE HERBICIDES, AND USE THEREOF

Albert W. Lutz, Princeton, and Robert E. Diehl, Lawrenceville, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 60,532, Jul. 25, 1979, Pat. No. 4,288,385. This application May 4, 1981, Ser. No. 260,490
Int. Cl.³ A01N *37/34*; C07C *121/52*
U.S. Cl. 71—105 **1 Claim**

1. A method for the selective preemergence control of monocotyledonous and dicotyledonous plant species in the presence of graminaceous crops comprising: applying to the soil containing the seeds or seedlings of the plants a herbicidally effective amount of the compound 5-[(1-ethylpropyl-)amino]-4,6-dinitro-o-tolyl acetonitrile.

4,430,115
BORON STAINLESS STEEL POWDER AND RAPID SOLIDIFICATION METHOD

Ranjan Ray, Burlington, Mass.; Donald E. Polk, Washington, D.C., and Bill C. Giessen, Cambridge, Mass., assignors to Marko Materials, Inc., N. Billerica, Mass.

Filed May 27, 1980, Ser. No. 153,775
Int. Cl.³ B22F *1/00, 1/04*
U.S. Cl. 75—0.5 R **2 Claims**

1. An alloy in powder form wherein said powders have an average particle size of less than 60 mesh (U.S. Standard) comprising platelets having an average thickness of less than 0.1 mm and each platelet being characterized by an irregularly shaped outline resulting from fracture thereof and having the composition represented by the general formula $Fe_{bal}Cr_{10\text{-}30}(Ni,Co)_{3\text{-}15}(Mo,W,Al,Cu,Ti,Cb,V,Ta,N)_{0.7\text{-}6}(Mn,Si)_{<3}C_{0.03\text{-}0.30}$ where the iron is present at a level of more than 50 wt% and may contain incidental impurities, said composition additionally alloyed with between 1.4 to 2.4 wt% boron, said alloy being prepared by the method comprising the steps:

(a) forming a melt of said alloy
(b) depositing said melt against a rapidly moving quench surface so as to quench said melt at a rate in the range of

approximately $10^{5°}$ to $10^{7°}$ C./sec and thereby form a rapidly solidified strip of said alloy characterized by predominantly body centered cubic or face centered cubic structure and

(c) comminuting said strip into powders.

4,430,116

METHOD AND APPARATUS FOR HEATING OR HEATING AND REDUCTION RAW MATERIALS FOR A METALLURGICAL FURNACE UTILIZING WASTE GASES FROM THE SAME FURNACE

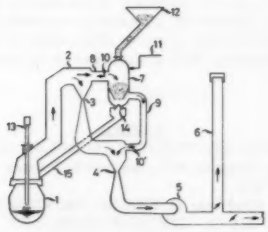
Shigeru Yamazaki, Kawasaki; Motoaki Hirao, Fujisawa; Tatuo Yamagishi, Urawa; Jun Nagai, Chiba; Hiroshi Ooi, Mitaka, and Yoshinobu Shinozaki, Yokohama, all of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha and Kawasaki Steel Corporation, both of Kobe, Japan

Filed Nov. 21, 1980, Ser. No. 209,178

Claims priority, application Japan, Nov. 22, 1979, 54-151785

Int. Cl.³ C21B *13/02, 13/14;* C21C *5/32*

U.S. Cl. 75—34 **1 Claim**



1. A heating or a heating and reduction method for heating or heating and reducing raw material to be charged into a metallurgical furnace, comprising the steps of

(A) supplying said raw material which is to be charged into a metallurgical furnace, into a reactor which is interposed in a bypass means connected to a waste gas pipe of said metallurgical furnace,

(B) closing a waste gas inlet and a waste gas outlet of said reactor along said bypass at an initial stage of blowing of said furnace, to shut off the flow of waste gas through said reactor, and supplying inert gas to said reactor to prevent the raw material from being oxidized,

(C) opening the waste gas inlet and waste gas outlet of said reactor when blowing of said furnace is performed to full-scale, to introduce at least a part of the waste gas into said reactor to bring the waste gas into contact with the raw material for heating or heating and reduction of the raw material,

(D) closing the waste gas inlet and waste gas outlet of said reactor along said bypass at the final stage of blowing of said furnace, and supplying inert gas to said reactor to prevent the raw material from being oxidized,

(E) repeating steps (B), (C) and (D), until the raw material is heated or heated and reduced to a predetermined extent, and

(F) opening a raw material outlet of said reactor to charge the raw material into said metallurgical furnace.

4,430,117

PRODUCTION OF STEEL

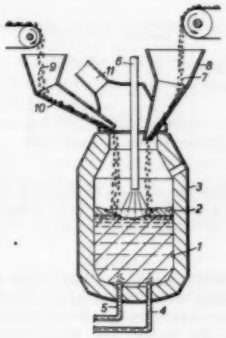
Gene D. Spenceley, Stokesley; Mervyn W. Davies, Near Yarm, and Alan L. Robson, Middlesbrough, all of England, assignors to British Steel Corporation, England

Filed Oct. 28, 1982, Ser. No. 437,503

Claims priority, application United Kingdom, Oct. 30, 1981, 8132732

Int. Cl.³ C21C *5/32, 5/34*

U.S. Cl. 75—51 **18 Claims**



1. A process for the production of steel, the steps of providing a ferrous melt in a container, introducing iron ore into the container and separately introducing carbonaceous material into the melt, blowing an oxidising gas at the upper surface of the melt by means of an overhead lance, and injecting a stirring gas directly into the melt below the upper surface thereof.

4,430,118

DESULFURIZATION AGENT

Alfred Freissmuth, Trostberg; Werner Gmöhling, Hufschlag, and Walter Meichsner, Krefeld, all of Fed. Rep. of Germany, assignors to SKW Trostberg Aktiengesellschaft, Trostberg, Fed. Rep. of Germany

Continuation of Ser. No. 250,361, Apr. 2, 1981. This application Sep. 29, 1982, Ser. No. 427,110

Claims priority, application Fed. Rep. of Germany, Jun. 18, 1980, 3022752

Int. Cl.³ C21C *7/02*

U.S. Cl. 75—58 **16 Claims**

1. An improved desulfurization agent comprising calcium carbide and diamide lime, wherein the improvement comprising said diamide lime having been treated by flotation or air sifting.

4,430,119

SELECTIVE REMOVAL OF MAGNESIUM IN THE CONSUMPTION OF ALUMINUM USED BEVERAGE CONTAINER SCRAP

Chester L. Zuber, Evansville, Ind., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Dec. 29, 1982, Ser. No. 454,269

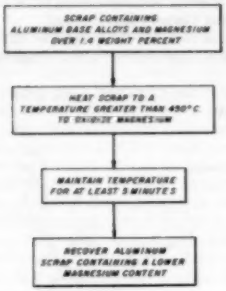
Int. Cl.³ C22B *21/06*

U.S. Cl. 75—63 **12 Claims**

1. A process for recovery of aluminum from aluminum-containing scrap wherein at least a portion of the aluminum scrap comprises one or more alloys of aluminum containing greater than 1.4 wt.% magnesium comprising:

(a) heating the aluminum scrap to a temperature of at least 850° F.; and

(b) maintaining the aluminum scrap at this temperature for a period of time long enough to oxidize sufficient magnesium therefrom for purposes of lowering the overall level of magnesium in an aluminum melt of the scrap.

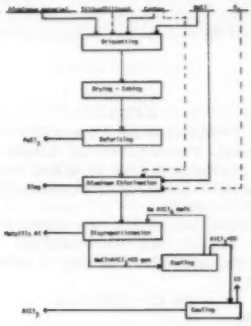

SCRAP CONTAINING ALUMINUM BASE ALLOYS AND MAGNESIUM OVER 1.0 WEIGHT PERCENT
HEAT SCRAP TO A TEMPERATURE GREATER THAN 450° C. TO OXIDIZE MAGNESIUM
MAINTAIN TEMPERATURE FOR AT LEAST 5 MINUTES
RECOVER ALUMINUM SCRAP CONTAINING A LOWER MAGNESIUM CONTENT

4,430,120

PROCESS FOR THE MANUFACTURE OF PURE METALLIC ALUMINUM FROM ALUMINUM ORES AND OTHER ALUMINUM-BEARING MATERIALS

Moshe Fruchter, 104 Hagalil Str., Haifa 32683, and Anutza Moscovici, 11 Dov Hoz Str., Rechovot 76580, both of Israel

Filed Jul. 24, 1981, Ser. No. 286,518
Int. Cl.³ C22B *21/02*
U.S. Cl. 75—68 B **9 Claims**



1. A process for the manufacture of pure aluminum metal from aluminum-bearing materials, comprising the following steps:

(a) homogeneously mixing the aluminum-bearing materials with a reducing agent, a chloridizing agent consisting essentially of an alkali metal chloride selected from the group consisting of sodium chloride, potassium chloride, lithium chloride and mixtures thereof, and optionally silica;

(b) drying the homogeneous mixture in a furnace at a temperature sufficient to cause coking of said mixture;

(c) heating the mixture in a furnace, to a temperature is the range of about 900° C. to 1200° C., whereby iron chloride is formed and volatilized;

(d) reacting the iron-free aluminum-bearing materials with said alkali metal chloride and reducing agent, optionally, oxygen and additional energetic coke, by heating to a temperature in the range of about 1200° C.–1800° C., resulting in aluminum monochloride gas and molten alkali metal silicate and,

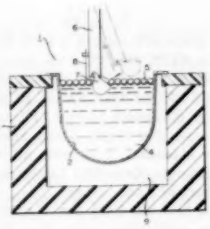
(e) rapidly cooling the aluminum monochloride-carbon monoxide mixed gas to about 650°–800° C., with a molten sodium-aluminum chloride mixture, whereby a disproportionation into volatile aluminum trichloride and pure aluminum metal occurs, and subsequently separating said products.

4,430,121

METHOD FOR COVERING THE SURFACE OF MOLTEN METAL, AND A COVERING MATERIAL THEREFOR

Shigeru Shima, Tokyo, Japan, assignor to Nichias Corporation, Japan and Hiroyasu Iihoshi, both of, Japan

Filed Jan. 26, 1982, Ser. No. 342,911
Int. Cl.³ C22B *9/00*
U.S. Cl. 75—96 **14 Claims**



1. A molten metal surface covering material for covering the surface of a molten metal to preserve the heat of the molten metal and to prevent oxidation of the molten metal by the surrounding atmosphere, comprising a plurality of floating elements, said floating elements being made of an inorganic refractory material which is insensitive to the molten metal to be covered.

4,430,122

FLUX-CORED ARC WELDING TUBULAR ELECTRODE

Uldis Pauga, Freeport, N.Y., assignor to Eutectic Corporation, Flushing, N.Y.

Filed Sep. 29, 1982, Ser. No. 427,882
Int. Cl.³ C22C *38/54*; B23K *35/36*
U.S. Cl. 75—123 B **9 Claims**

1. A weld deposit consisting essentially of about 0.4 to 0.8% C, about 4.8 to 6.2% B, about 1.6 to 3.0% Mn, about 1.6 to 2.8% Ni, about 1.4 to 2.4% Si and the balance essentially iron.

4,430,123

PRODUCTION OF VERMICULAR GRAPHITE CAST IRON

William Simmons, Birmingham, England, assignor to Foseco International Limited, Birmingham, England

PCT No. PCT/GB80/00193, § 371 Date Aug. 5, 1981, § 102(e) Date Aug. 5, 1981, PCT Pub. No. WO81/01861, PCT Pub. Date Jul. 9, 1981
PCT Filed Nov. 5, 1980, Ser. No. 290,802
Claims priority, application United Kingdom, Dec. 19, 1980, 7943698
Int. Cl.³ C22C *33/08*
U.S. Cl. 75—130 R **12 Claims**

1. In a process for treating molten iron containing carbon and sulphur to produce a cast iron having a vermicular graphite structure, the improvement which comprises determining the sulphur content of the iron and adding to the molten iron simultaneously up to 0.3% by weight of the iron of one or more rare earth metals as such or as an alloy thereof and in excess of 0.2% by weight of the iron of calcium as such or as an alloy thereof, the quantity of rare earth metal added being within the range of 2 to 8 times the sulphur content of the molten iron and such as to give the iron when cast a vermicular graphite structure.

4,430,124
VACUUM TYPE BREAKER CONTACT MATERIAL OF COPPER INFILTRATED TUNGSTEN

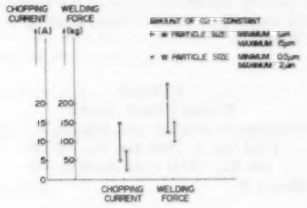
Masaru Kato, Amagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 98,198, Nov. 27, 1979, abandoned. This application Mar. 22, 1982, Ser. No. 360,572

Claims priority, application Japan, Dec. 6, 1978, 53-153381

Int. Cl.³ H01H *1/02*; B22F *3/26*

U.S. Cl. 75—248 **1 Claim**



1. A vacuum type breaker contact material prepared by infiltrating copper into a sintered tungsten matrix, wherein the maximum value of tungsten particle size within the finished material is not larger than 2 μm and the minimum value of tungsten particle size within the finished material is not smaller than 0.5 μm.

4,430,125
PROCESS OF MANUFACTURE OF A COMPOSITE MATERIAL AND COMPOSITE MATERIAL MANUFACTURED BY THIS PROCESS

Waldemar Hascic, Enzersdorf-Südstadt, Austria, assignor to Empex Mineral-Und Naturfaserprodukts AG, Villars-sur-Glane, Switzerland

Filed Apr. 28, 1982, Ser. No. 372,713

Claims priority, application Switzerland, May 11, 1981, 3029/81

Int. Cl.³ C04B *19/04*

U.S. Cl. 106—81 **15 Claims**

1. A process for manufacturing a composite material consisting essentially of a mixture of a fibrous material, an alkali metal silicate, a fluosilicate, a member selected from the group consisting of a metallic oxide and a basic metallic silicate, which member is capable of reacting with the alkali metal silicate to form a silicate having a melting point which is higher than that of the alkali metal silicate, and, optionally, a filler, which comprises the steps of:

(1) forming a mixture of a fibrous material, an alkali metal silicate, a lower than stoichiometric amount of a fluosilicate relative to said alkali metal silicate, a member selected from the group consisting of a metallic oxide and a base metallic silicate, said member being reactive with said alkali metal silicate and, optionally, a filler;

(b) forming said mixture into the desired configuration; and

(c) subjecting said formed mixture to heat and pressure to produce a hardened composite material having a high mechanical strength and fire-proof quality.

4,430,126
HYDRAULICALLY SETTING SHAPED BRICK, PARTICULARLY FOR CONSTRUCTION, AND METHOD FOR ITS PRODUCTION

Manfred Ackermann; Rolf Köhling, both of Bochum, and Dieter Leininger, Essen, all of Fed. Rep. of Germany, assignors to Bergwerksverband GmbH, Essen, Fed. Rep. of Germany

Filed Feb. 26, 1982, Ser. No. 352,847

Claims priority, application Fed. Rep. of Germany, Feb. 27, 1981, 3107374; Dec. 3, 1981, 3147855

Int. Cl.³ C04B *31/02*, *31/12*

U.S. Cl. 106—97 **33 Claims**

1. Hydraulically setting shaped brick for construction composed of

(a) 4–30% by weight hydraulically binding agent;

(b) about 60–95% by weight mineral aggregate material as substitute for sand; and

(c) 0–10% other admixtures, the aggregate material comprising country rock (mining waste material) with striking disintegration tendency, obtained from digestion and/or from extraction of mineral wealth from mining, and having a grain size up to 15 mm and a finest grain portion under 0.2 mm from 10 to 45% by weight.

4,430,127
EPOXYLATED AMINE ASPHALT ANTI-STRIPPING AGENT

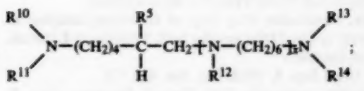
Dennis W. Gilmore and Raymond S. Dalter, both of Cincinnati, Ohio, assignors to Carstab Corporation, Reading, Ohio

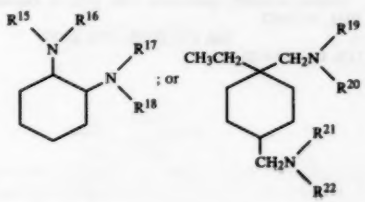
Filed Oct. 21, 1981, Ser. No. 313,520

Int. Cl.³ C08L *95/00*

U.S. Cl. 106—273 N **7 Claims**

1. A composition comprising a bituminous material and, in an amount effective to impart anti-stripping properties to said bituminous material, an epoxylated polyamine anti-stripping agent comprising a compound or mixture of compounds having the formula:



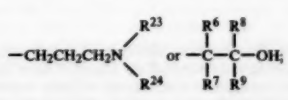


wherein

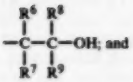
R^5 is —H or $-CH_2CH_2CH_2NH_2$;

x=0 or 1;

R^{10}, R^{11}, R^{12}, R^{13}, R^{14}, R^{15} and R^{17} are each —H,

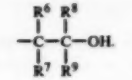


R^{16}, R^{18}, R^{19}, R^{20}, R^{21}, R^{22}, R^{23} and R^{24} are each —H or



R^6, R^7, R^8 and R^9 are each —H, alkyl, alkenyl, aryl, alkaryl or aralkyl;

with the proviso that at least one of R^{10}, R^{11}, R^{12}, R^{13}, R^{14}, R^{15}, R^{16}, R^{17}, R^{18}, R^{19}, R^{20}, R^{21}, R^{22}, R^{23} and R^{24}



4,430,128

AQUEOUS ACID COMPOSITION AND METHOD OF USE

Wayne W. Frenier, Tulsa County, Okla., and David A. Wilson, Brazoria County, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Dec. 5, 1980, Ser. No. 213,280

Int. Cl.³ C23G *1/02*

U.S. Cl. 134—3 **5 Claims**

1. A process for removing a predominantly iron oxide scale from a ferrous metal surface and for passivating said metal surface, said process comprising the steps of:

(1) removing said iron oxide scale by contacting said scale with the aqueous acid composition having a PH of less than about 3 and comprising (a) at least about 1 weight percent of hydroxyethylethylene diaminetriacetic acid (HEDTA) dissolved therein, and (b) a compatible acid corrosion inhibitor, and

(2) while the ferrous metal surface is free or substantially free of iron oxide-containing scale, contacting said metal surface with an aqueous alkaline liquid having an oxidant dissolved, dispersed, or entrained therein.

4,430,129

METHOD OF CLEANING HOLLOW CONDUCTORS OF COOLED ELECTRICAL MACHINES

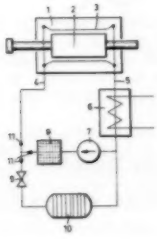
Gerold Gamer, Mannheim, Fed. Rep. of Germany, assignor to Brown, Boveri & Cie Aktiengesellschaft, Mannheim-Käfertal, Fed. Rep. of Germany

Filed Sep. 1, 1982, Ser. No. 413,771

Claims priority, application Fed. Rep. of Germany, Sep. 2, 1981, 3134803

Int. Cl.³ B08B *3/08, 9/06*

U.S. Cl. 134—22.19 **11 Claims**



1. Method for chemical cleaning of water-cooled waveguides of electric machines whose interiors have become corroded which comprises circulating cooling water through waveguides of an electric machine, cooling the water after discharge from the waveguides, and returning the cooled water to the waveguides by a pump which maintains the cooling cycle of the circulating water, and a closable bypass with an interposed ion exchanger connected to the cooling cycle, the combination therewith of closing the bypass and adding a complexing agent into the cooling cycle with the bypass closed to effect removal of at least some of the corrosion products in the waveguides into the circulating water, thereafter opening the bypass to cause the water containing impurities after cleaning the waveguides to flow in contact with the ion exchanger to effect purification of the water, and repeating said operations of closing the bypass and adding a complexing agent, and thereafter opening the bypass to purify the water by contact with the ion exchanger, until sufficient cleaning of the waveguides is effected.

4,430,130

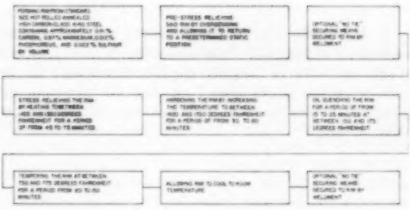
BASKETBALL GOAL

Roald H. Sorensen, 3224 Marie Dr., Raleigh, N.C. 27604

Filed Sep. 8, 1981, Ser. No. 299,808

Int. Cl.³ C21D *9/00*; A63B *63/08*

U.S. Cl. 148—12 B **11 Claims**



5. The method of producing an improved basketball goal rim comprising: forming the rim from standard sized diameter hot rolled annealed high carbon spring steel rod; stress relieving the formed rim by heating it to between 1100 and 1350 degrees Fahrenheit for a period of from 45 to 75 minutes; increasing the temperature to between 1400 and 1700 degrees Fahrenheit and maintaining such temperature for a period of from 30 to 60 minutes; oil quenching the rim at 150 to 175 degrees Fahrenheit for a period of 15 to 25 minutes; tempering said rim at 750 to 775 degrees Fahrenheit for a period of 90 to 150 minutes; and allowing said rim to cool to room temperature whereby an improved basketball rim is provided which can withstand at least 800 pounds of static load and deflect at least two inches without permanent yield.

4,430,131

POLYURETHANE BINDERS

Meude Tremblay, Charlesbourg, Canada, assignor to Her Majesty the Queen in right of Canada, Ottawa, Canada

Division of Ser. No. 123,948, Feb. 25, 1980. This application Nov. 6, 1981, Ser. No. 318,804

Int. Cl.³ C06B *33/02, 33/06*; C08G *18/08*; C08L *75/06*

U.S. Cl. 149—19.4 **9 Claims**

1. A process for the preparation of a polyurethane binder comprising reacting a diisocyanate with a block or sequenced co-polyester diol of the structural formula I

$$H(OR_3COOR_4CO)_xOCH_2CH_2O[CO(CH_2)_5O]_yH \quad I$$

which comprises simultaneously reacting ϵ-caprolactone in the presence of a catalyst with

(i) a diol of structural formula II

$$HO—R—OH \quad II$$

as co-catalyst for the reaction wherein R is an alkyl group containing 1 to 8 carbon atoms or an alkyl group contain-

ing 1–12 carbon atoms having a nitrogen atom in its backbone; and

(ii) a di-carboxylic acid of structural formula III

$$HOOC(CH_2)_mCOOH \qquad III$$

wherein m is an in integer from 1 to 36, and wherein R_3 is the residual structure of a diol of structural formula II and R_4 is the residual structure of a diacid of structural formula III, and x and y are integers of about 1–10.

5. A polyurethane binder for use in a solid propellant comprising the reaction product of a diisocyanate and a block or sequenced co-polyester diol produced by the process of claim **1** and having the structural formula

$$H(OR_3COOR_4CO)_xOCH_2CH_2O[CO(CH_2)_5O]_yH \qquad I$$

wherein R_3 is the residual structure of a diol of structural formula II

$$HO—R—OH \qquad II$$

in which R is an alkyl group containing 1 to 8 carbon atoms or an alkyl group containing 1–12 carbon atoms having a nitrogen atom in its backbone; and R_4 is the residual structure of a diacid of structural formula III

$$HOOC(CH_2)_mCOOH \qquad III$$

in which m is an integer from 1 to 36; x is an integer from about 1 to 10; and y is an integer from about 1 to 10.

9. A co-polyester-urethane propellant comprising by weight about 70% of ammonium perchlorate, about 18% of finely divided aluminum, and about 12% of a binder as defined in claim **5**.

4,430,132

DESENSITIZING EXPLOSIVES

Alfred E. Painter, Bridgewater, England, assignor to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Continuation of Ser. No. 903,838, May 8, 1979, abandoned. This application Jul. 29, 1980, Ser. No. 173,396

Claims priority, application United Kingdom, May 11, 1977, 19868/77

Int. Cl.³ C06B *45/22*

U.S. Cl. 149—109.6 **10 Claims**

1. A process for desensitising a particulate explosive with a wax which comprises,

(1) stirring a water-insoluble wax, having a softening point below the safe decomposition temperature of the explosive, with a paste of the water-insoluble explosive in an aqueous medium;

(2) heating and stirring the resulting mixture of wax and explosive paste until the water has evaporated from the surfaces of the explosive particles and the wax has at least softened and has become coated onto the surface of the explosive particles; and

(3) cooling and stirring the resulting wax-coated explosive particles to below the softening point of the wax until the wax on the explosive particles has solidified.

4,430,133

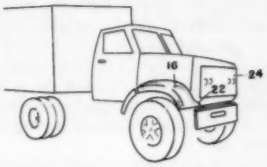
PROCESS FOR REPAIRING BODY PARTS ON VEHICLES OR THE LIKE

Frederick L. F. Griffith, 239 New Brunswick Ave., Perth Amboy, N.J. 08861, assignor to Frederick L. F. Griffith, New York, N.Y.

Filed Nov. 13, 1981, Ser. No. 321,078

Int. Cl.³ B32B *35/00*

U.S. Cl. 156—94 **6 Claims**



1. Process for installation of an-over-dimensioned replacement part of a damaged FRP or rigidized acrylic vehicle or the like, which comprises:

(a) placing a premanufactured over-dimensioned, duplicate part over the damaged part,

(b) the dimensions of said over-dimensioned duplicate part exceeding those of the damaged part, and

(c) adhering said duplicate part to said damaged part,

(d) the surface of said duplicate part generally conforming to the surface of said damaged part which is adhered thereto whereby said vehicle is repaired, the structure of said duplicate part being similar enough to that of the original to serve the same function.

4,430,134

METALLIZED BOTTOM CONTAINER AND PROCESS OF OBTAINING THE SAME

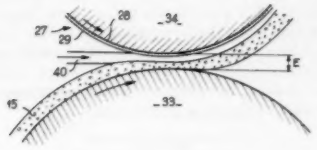
Augustin H. Gras, Rochefort du Gard, France, assignor to Lauragri S.A., Noves, France

Continuation of Ser. No. 120,033, Feb. 11, 1980, abandoned. This application Aug. 12, 1981, Ser. No. 292,089

Claims priority, application France, Feb. 9, 1979, 79 03921; Dec. 28, 1979, 79 32039

Int. Cl.³ B31F *1/00*

U.S. Cl. 156—224 **6 Claims**



1. The process of continuous manufacture of composite articles by manufacturing a composite band for packing products such as meat, said process comprising the steps of:

unwinding a relatively thin film of bi-directional polystyrene coated with a layer of aluminum and simultaneously a relatively thick band of expanded polystyrene and circulating them between opposed calendering cylinders with the non-aluminized surface of the film of bi-directional polystyrene facing the band of expanded polystyrene, and

extruding a continuous intermediate film of polystyrene from an extruder head and inserting said extruded continuous film between the band of expanded polystyrene and said film of bi-directional polystyrene in a contact zone therebetween while applying pressure between said calendering cylinders, and

maintaining said extruded continuous film at a temperature

at least equal to its softening point to cause the surface of the film of bi-directional polystyrene and the surface of the band of expandable polystyrene contacting said continuous extruded film to soften to effect thermobond adhesion of said continuous extruded film to said band of expanded polystyrene and to said film of bi-directional polystyrene while heating the calendering cylinder in contact with the aluminum layer of said film of bi-directional polystyrene to maintain a relatively high temperature for said layer of aluminum to prevent said layer of aluminum from drawing heat thereto and while cooling of said calendering cylinder in contact with said polystyrene band to maintain that cylinder at near ambient temperature, whereby said expanded polystyrene band in contact with the cooled cylinder functions with the cooled cylinder to draw heat away from said extruded continuous intermediate film of polystyrene to prevent damage of said layer of aluminum, and

thermal forming and cutting of said composite band to obtain a composite article.

4,430,135
ADHESIVE BLENDS AND METHODS OF MAKING COMPOSITE STRUCTURES

Seymour Schmukler, Palatine; John Machonis, Jr., Schaumburg, and Mitsuzo Shida, Barrington, all of Ill., assignors to Chemplex Company, Rolling Meadows, Ill.

Division of Ser. No. 452,873, Dec. 23, 1982, which is a division of Ser. No. 327,278, Dec. 4, 1981, Pat. No. 4,409,364. This application Jul. 1, 1983, Ser. No. 510,419

Int. Cl.[3] **C08J** *5/00, 5/12*

U.S. Cl. 156—244.11 **2 Claims**

1. A method of making a composite structure of components comprising:

(a) a substrate, and adhered thereto;

(b) an adhesive blend consisting essentially of

(i) about 0.1–40 parts by weight in said blend of a graft copolymer of about 70–99.999 wt. % of a polyethylene backbone grafted with about 30–0.001 wt. % of at least one grafting monomer comprising at least one polymerizable ethylenically unsaturated carboxylic acid or carboxylic acid anhydride for a total of 100% and

(ii) about 99.9–60 parts by weight of a blending resin mixture of about 25–90 wt. % of a high density polyethylene and about 75–10 wt. % of a polypropylene for a total of 100% and wherein said components are adhered together by methods including blown film coextrusion, cast film coextrusion coating, blow molding coextrusion, lamination, extrusion or coextrusion coating, powder coating, rotomolding, profile coextrusion or wire coating extrusion or coextrusion.

4,430,136
PROCESS FOR PREPARING OPEN-CELL STRUCTURE OF VINYL CHLORIDE RESIN

Toshio Tsuchiya, Tokyo; Syuichi Moriizumi, Saitama; Hisashi Takeda, Chiba, and Akinori Arai, Saitama, all of Japan, assignors to Lonseal Corporation, Tokyo, Japan

Filed Aug. 23, 1982, Ser. No. 410,563

Claims priority, application Japan, Dec. 15, 1981, 56-202989

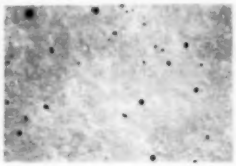
Int. Cl.[3] **B29C** *19/00*

U.S. Cl. 156—246 **22 Claims**

1. A process for preparing an open-cell structure from a vinyl chloride resin, said process comprising the steps of:

(a) mixing a vinyl chloride resin, stabilizer, plasticizer, surface active agent, azodicarbonamide and 4,4'-oxybisbenzenesulfonyl hydrazide to form a vinyl chloride resin paste;

(b) rendering the vinyl chloride resin paste of step (a) alkaline, and mixing the alkaline paste to form a uniformly-mixed paste;



(c) permitting said uniformly-mixed paste of step (b) to expand; and

(d) heating said paste of step (c) to cause gelation.

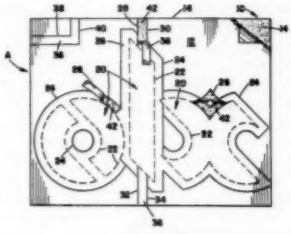
4,430,137
PAINT MASK AND METHOD

Wallace R. Jones, Waite Hill Village, Ohio, assignor to The Excello Specialty Company, Cleveland, Ohio

Division of Ser. No. 316,925, Oct. 30, 1981, Pat. No. 4,397,261. This application Jun. 3, 1983, Ser. No. 500,885

Int. Cl.[3] **B05C** *21/00;* **B32B** *31/18*

U.S. Cl. 156—247 **6 Claims**



1. A method of masking a predetermined design configuration on a work surface, said method comprising the steps of:

(a) providing a mask structure having a first mask layer including an adhesive on one surface thereof and a second liner layer adhesively secured to said first layer one surface;

(b) defining a predetermined design configuration within said mask structure by means of discontinuous cuts extending through both said first and second layers;

(c) placing score cuts through said second layer in spaced relationship to said discontinuous cuts for defining band-like areas in said second layer between said discontinuous and score cuts;

(d) removing the band-like areas of said second layer for exposing corresponding bands of adhesive therebeneath on said first layer;

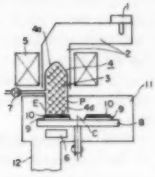
(e) affixing said mask structure to a work surface by said adhesive bands with said design configuration disposed in a desired orientation; and,

(f) thereafter removing that portion of said mask disposed on the other side of said discontinuous cuts from said score cuts from covering association with the work surface, said step of removing being performed along said discontinuous cuts.

4,430,138
MICROWAVE PLASMA ETCHING APPARATUS HAVING FAN-SHAPED DISCHARGE

Keizo Suzuki; Sadayuki Okudaira; Shigeru Nishimatsu, all of Kokubunji, and Ichiro Kanomata, Fuchu, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 7, 1980, Ser. No. 138,082
Claims priority, application Japan, Apr. 6, 1979, 54-41109
Int. Cl.³ C23F *1/02*
U.S. Cl. 156—345 **1 Claim**



1. A microwave plasma etching apparatus for exposing a sample to a microwave discharge plasma, comprising:

a discharge tube which has an opening portion confronting the surface of said sample, said opening portion being formed into the shape of a fan;

means to generate a microwave discharge plasma in said discharge tube; and

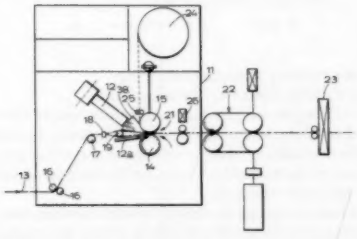
means for moving said sample along a circular path whose center coincides with the pivot of said fan,

wherein said discharge tube is gradually tapered from a portion having a circular sectional shape towards said fan-shaped opening portion.

4,430,139
APPARATUS FOR MANUFACTURING CABLE

John R. Baverstock, Stoke-on-Trent, England, assignor to Lucas Industries Limited, Birmingham, England

Division of Ser. No. 65,854, Aug. 13, 1979, Pat. No. 4,381,208. This application Sep. 30, 1982, Ser. No. 428,862
Claims priority, application United Kingdom, Aug. 15, 1978, 33340/78
Int. Cl.³ H01B *13/06*
U.S. Cl. 156—353 **32 Claims**

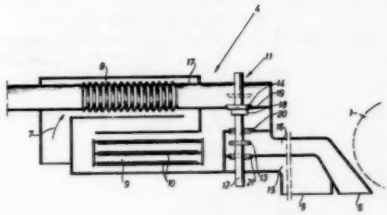


1. Apparatus for manufacturing multi-core cable of the kind in which a plurality of conductive cores are held in parallel and side-by-side relation by surrounding insulation formed from thermoplastic material, the apparatus including drive means for continuously driving through the apparatus a plurality of substantially continuous conductive cores in side-by-side, substantially parallel and spaced relationship, simultaneously with surrounding insulation formed from thermoplastic material, a bonding station including hot air blower means for blowing hot air on the insulation of the cable as the cable passes through the bonding station to heat the insulation and cause fusion of the insulation throughout major portions of the length of the cable, and interruptor means for interrupting the heating of the insulation at predetermined regions along the length of the cable which are short compared to said major portions, so that in the resultant cable the cores are insulated and held in position relative to one another throughout their length by the surrounding insulation except at said regions wherein the cores are separate from one another.

4,430,140
METHOD AND AN ARRANGEMENT FOR THE MANUFACTURE OF CASINGS

Herwig Pupp; Otto B. Andersson, both of Lund, and Jan-Erik Nilsson, Staffanstorp, all of Sweden, assignors to Tetra Pak International AB, Lund, Sweden

Division of Ser. No. 972,802, Dec. 26, 1978, Pat. No. 4,284,448. This application Mar. 18, 1981, Ser. No. 245,017
Claims priority, application Sweden, Dec. 23, 1977, 7714734
Int. Cl.³ B32B *31/00*; G05G *15/00*; H05B *3/02*; B39C *27/00*
U.S. Cl. 156—356 **6 Claims**



1. An arrangement for the manufacture of casings of thermoplastic, heat-shrinkable material comprising forming tool means for the winding of a material sheet to casing-shape and means for joining together ends of the material sheet in casing-shape, heating set means arranged along a feed track for the material sheet, said heating set means having a preheating unit for the heating of the main length of the material sheet, and an intensive heating unit for the heating of a front end of the sheet facing towards the forming tool means, the heating set means being a hot air type and comprising a valve which selectively conducts a hot air stream to the preheating unit and/or to the intensive heating unit.

4,430,141
MACHINE FOR LABELING OBJECTS, ESPECIALLY BOTTLES

Rudolf Zodrow, Dusseldorf, Fed. Rep. of Germany, assignor to Jagenberg Werke AG, Dusseldorf, Fed. Rep. of Germany

Continuation of Ser. No. 276,407, Jun. 22, 1981, abandoned. This application Jun. 1, 1983, Ser. No. 499,414
Claims priority, application Fed. Rep. of Germany, Jun. 27, 1980, 3024164
Int. Cl.³ B32B *31/00*; G05G *15/00*; B29C *17/00*
U.S. Cl. 156—360 **10 Claims**

1. In a labeling machine for objects such as bottles, comprising a bottle carrier having turntables for the bottles, a support, a label gripper cylinder with transfer members, drive means coupling the support and the gripper cylinder so as to drive pickup elements successively past a glue roller, label stack and the gripper cylinder and means for rotating each turntable comprising a fixed cam groove cam and cam follower so that

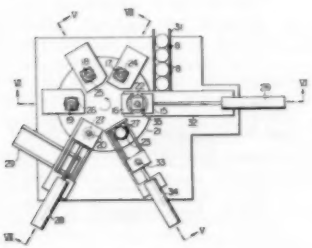
during transfer of a label from the gripper cylinder to a bottle there is substantially synchronism between the transfer members of the gripper cylinder and the bottle areas to which the labels are to be applied, the improvement comprising means for readily adjusting the movement of the pickup elements and turntables to handle bottles of different radius and/or labels of different size wherein the fixed cam groove cam in the area of the gripper cylinder includes a cam groove section normally traversed by the cam follower and which is movable with respect to the remainder of the fixed cam groove cam to effect replacement with another cam groove section which is thereafter traversed by the cam follower during use of the machine instead of the first mentioned cam groove section.

4,430,142

APPARATUS FOR ATTACHING A BOTTOM PLATE MADE OF A PLASTIC MATERIAL TO ONE END OF AN OPEN ENDED, HOLLOW CYLINDER MADE OF A PLASTIC MATERIAL

Takashi Ochi, Wako, and Fumihiko Kaneko, Ibaraki, both of Japan, assignors to Sumitomo Bakelite Company, Japan

Filed Dec. 9, 1980, Ser. No. 214,817
Claims priority, application Japan, Mar. 6, 1980, 55-27365
Int. Cl.³ B32B *31/20*
U.S. Cl. 156—379.9 **6 Claims**



1. An apparatus for securing a bottom plate made of a plastic material to one end of an open-ended, hollow cylinder comprising:

a rotatable table;

a plurality of bottom plate support posts each for supporting a bottom plate made of a plastic material to be welded to one end of an open-ended, hollow cylinder for producing a plastic container, said bottom plate support posts being at least six in number and arranged equidistantly from one another in an outer marginal portion of said rotatable table; and having an outer diameter slightly smaller than the inner diameter of the open-ended, hollow cylinder to be formed into a plastic container;

means located in a first working station for placing one bottom plate made of a plastic material on each bottom plate support post;

means located in a second working station for positioning one open-ended, hollow cylinder made of a plastic material in enclosing relation to each bottom plate support post and moving the open-ended, hollow cylinder downwardly until a portion alone of the open-ended, hollow cylinder to be welded is disposed above the bottom plate support post;

means located in a third working station for heating and bending radially inwardly the portion to be welded, comprising a metallic die recessed in substantially the same shape as the bottom portion of the open-ended, hollow cylinder, a heater mounted in an outer marginal position of said metallic die, and a cylinder-piston arrangement for vertically moving said metallic die, said recessed portion of said metallic die being rounded in a portion thereof which is brought into contact with the portion of be welded of each open-ended, hollow cylinder not bent yet, whereby the portion to be welded is bent inwardly by contact with said rounded portion of said recessed portion of said metallic die;

means located in a fourth working station for welding together the radially inwardly bent portion of the open-ended, hollow cylinder and the bottom plate both made of a plastic material to produce a bottomed, hollow cylinder, comprising a metallic die serving concurrently as a high frequency anode terminal cooperating with each bottom plate support post serving concurrently as a high frequency cathode terminal, a cylinder-piston arrangement for vertically moving said metallic die for applying pressure to the portion to be welded of each open-ended, hollow cylinder and each bottom plate held between said high frequency anode terminal and said high frequency cathode terminal, and a high frequency device for passing high frequency current between said anode terminal and said cathode terminal;

means located in a fifth working station for cooling the welded portion of the bottomed, hollow cylinder; and

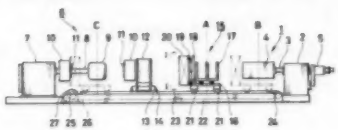
means located in a sixth working station for removing the bottomed, hollow cylinder from the rotatable table as a cylindrical plastic container produced by the apparatus.

4,430,143

TIRE BUILDING MACHINE

Tohru Aihara, Hiratsuka, Japan, assignor to The Yokohama Rubber Co., Ltd., Tokyo, Japan

Filed Jun. 30, 1982, Ser. No. 393,769
Claims priority, application Japan, Jul. 3, 1981, 56-104247
Int. Cl.³ B29H *17/22*
U.S. Cl. 156—403 **5 Claims**



1. A tire building machine comprising:

a band building device for building bands,

a tire building device provided at a position spaced from said band building device, said tire building device including a green tire building drum positioned in the center and bead setters on the both sides, that is, on the head stock side and the tail stock side, and

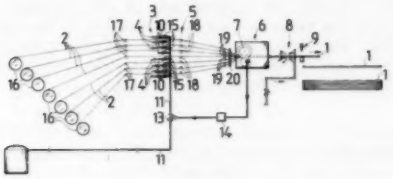
a band transfer device movably provided between said band building device and tire building device to transfer said band built by said band building device to the building drum of said tire building device,

said band transfer device having a bead supply means on the side facing said tire building device, said bead supply means comprising a bead retaining part having a plurality of divided segments arranged in a ring and movable in the radial direction of the ring, said ring being expansible, and a bead kicking means for kicking a bead retained on said bead retaining part out onto the bead ring of said tire building device while said band transfer device surrounds said building device, said bead supply means being adapted to supply beads on the bead retaining part to said bead setter on the head stock side.

4,430,144
MEANS FOR MANUFACTURING SECTION MULTI-PLY CARDBOARD

Nils P. E. Österman, Köpbacka, 07900 Loviisa, Finland

Continuation-in-part of Ser. No. 61,236, Jul. 26, 1979, abandoned. This application Sep. 12, 1980, Ser. No. 186,755
Claims priority, application Finland, Dec. 9, 1978, 782788
Int. Cl.³ B32B *35/00*
U.S. Cl. 156—497 3 Claims

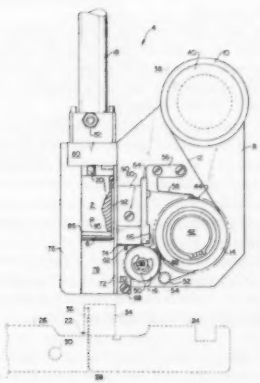


1. In an apparatus for manufacturing multi-ply material including means for heating webs of thermoplastic coated material having a direction of movement and means for bonding the heated webs with pressure rollers to create a multi-ply material, the improvement comprising the means for heating the webs of thermoplastic material being flames, said flames being directed substantially opposite the direction of movement of the webs of thermoplastic coated material substantially parallel to such webs in close proximity thereto to directly heat the webs, the means for bonding the heated webs with pressure rollers also creating longitudinal channels in the bonded multi-ply material and the addition of a cooling means, said cooling means including means to introduce a liquid into the longitudinal channels in the bonded multi-ply material, means to remove such liquid from the longitudinal channels and forced air means to remove the residue of such liquid from the longitudinal channels.

4,430,145
SPLICER PRESSER PAD

Richard G. Berube, Marlborough, Mass., assignor to King Instrument Corporation, Westboro, Mass.

Filed Jan. 26, 1983, Ser. No. 461,261
Int. Cl.³ B31F *5/06;* B65C *9/36*
U.S. Cl. 156—497 5 Claims



2. In combination with a machine for loading a selected supply tape into a cassette which includes a tape leader, said machine having a splicing block assembly for supporting the leading end of the supply tape and the leader of the cassette to be loaded, and improved splicing means for splicing a section of said leader and said supply tape together, said improved splicing means comprising in combination:

means for feeding an elongate splicing tape;

tape feed operating means for operating said tape feed means so that a predetermined amount of tape is advanced by said tape feeding means;

guide means for positioning the leading end of said tape as it is advanced by said tape feeding means;

cutting means for severing a length of said tape including the leading end thereof at a selected point relative to said guide means;

a plunger guide channel;

means for dispensing said severed length of tape comprising a plunger disposed within said guide channel;

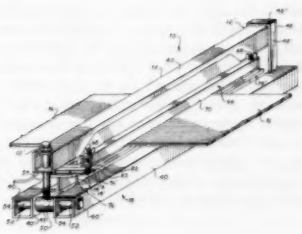
means for releasably holding said severed length of tape against the bottom surface of said plunger; and

a pressure member attached to said plunger bottom surface for forcing said severed length of tape onto materials to be spliced, said pressure member comprising a resilient pad having a bottom surface characterized by criss-crossed slots penetrating perpendicular to said surface, said pad having one or more apertures through its thickness to provide vacuum communication between said slots and one or more corresponding vacuum passageways within said plunger.

4,430,146
BELT SPLICING APPARATUS AND METHOD AND SPLICE FORMED THEREBY

Eric R. Johnson, Charlotte, N.C., assignor to Scandura, Inc., Charlotte, N.C.

Filed Feb. 22, 1982, Ser. No. 351,237
Int. Cl.³ B30B *15/34*
U.S. Cl. 156—502 9 Claims



1. Apparatus for splicing two belt ends or the like having outer surfaces of thermoplastic material comprising a pair of electrically conductive longitudinal bar means adapted for opposed facing disposition for engaging therebetween said two belt ends in juxtaposed relation for splicing thereof and electrically conductive clamping means for selectively engagingly drawing said pair of bar means together to grippingly retain said belt ends therebetween and to electrically connect said pair of bar means for flow of electrical current therebetween, said pair of bar means including on their respective facing sides respective longitudinal platen means forming respective belt engaging surfaces for substantially continuous surface contact along said belt ends on opposite sides thereof, each said platen means including longitudinal electrical heating means for heating its respective engaging surface, each said heating means being electrically connected at one end thereof to its respective bar means and being electrically insulated from its respective bar means along its entire remaining length with the opposite end of each said heating means being electrically connected to one of two opposed terminals of an electrical source, thereby providing upon clamped assembly of said pair of bar means and said clamping means a complete electrical circuit between said terminals through each said heating means and respectively

therefrom through and between said pair of bar means and said clamping means for generating heat in each said heating means upon energization of said electrical source to splice said belt ends by fusion of the thermoplastic material thereof.

4,430,147

HOT MELT ADHESIVE APPLICATORS

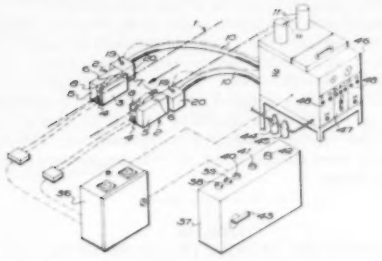
John C. Harston, and William E. Hampton, both of Clevedon, England, assignors to Kliklok Corporation, Greenwich, Conn.

Filed Aug. 27, 1982, Ser. No. 411,999

Claims priority, application United Kingdom, Sep. 3, 1981, 8126723

Int. Cl.³ B32B *31/00*

U.S. Cl. 156—578 **8 Claims**



1. A hot melt adhesive applicator comprising an enclosed wheel glue pot the sides of which fit closely to the sides of the applicator wheel, a doctor blade preceding the applicator wheel, an anti-stringout wheel following the applicator wheel, a remote tank forming a reservoir for adhesive, a flexible hose from the tank to the glue pot, a pump for feeding adhesive from the tank through the hose, heating means for the tank and hose and glue pot, passages in one side of the glue pot for feeding adhesive from the hose to a pool between the underside of the doctor blade and the periphery of the applicator wheel, and switch means for actuating the pump, there also being provided a chamber between the hose and the passages in the glue pot, with an inlet from the hose and an outlet to the passages in the glue pot, and adhesive level sensing means in the chamber adapted to operate the switch means when the adhesive level in the chamber falls below a predetermined level.

4,430,148

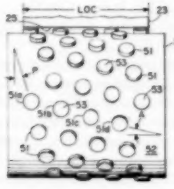
ULTRASONIC BONDING APPARATUS

Jean E. Schaefer, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Apr. 27, 1982, Ser. No. 372,404

Int. Cl.³ B29C *27/08*

U.S. Cl. 156—580.2 **7 Claims**



1. In an apparatus for effecting discontinuous patterned ultrasonic bonding of laminae which apparatus includes an anvil having a discontinuous pattern surface corporately defined by outwardly facing areas of a multiplicity of discrete pattern protuberances and which areas have a common elevation, an ultrasonic bonding transducer having a tip which is configured and disposed to contact said pattern surface along a predetermined line-of-contact, means for biasing said transducer tip towards the pattern surface, means for moving the pattern surface of the anvil relative to said transducer tip to so define a machine direction that said line-of-contact extends transverse the machine direction and so that pattern bonding of the laminae is effected as the laminae are forwarded in the machine direction while fixedly associated with the discontinuous pattern surface, the improvement wherein said discrete pattern protuberances are so configured and disposed in said machine direction that cobblestoning of said transducer tip relative to the pattern surface is obviated and so that every imaginary line which extends transverse said anvil at the common elevation of said outwardly facing areas touches some portion of said discontinuous pattern surface.

4,430,149

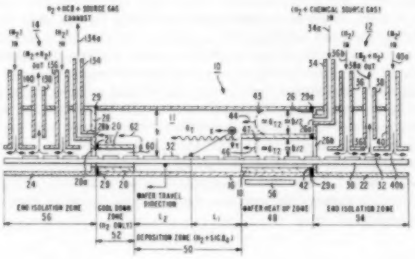
CHEMICAL VAPOR DEPOSITION OF EPITAXIAL SILICON

Samuel Berkman, Florham Park, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 30, 1981, Ser. No. 335,683

Int. Cl.³ H01L *21/205*

U.S. Cl. 156—613 **5 Claims**



1. A method for silicon epitaxial growth by continuous chemical vapor deposition of silicon material deposited continuously epitaxially on a flat substrate surface of crystalline material in a reactor tube defined by an elongated open chamber having a longitudinal axis and having respective ends connected to a gas input section and a gas output section, comprising the steps of:

providing at said input section a longitudinal substantially laminar flow of a first stream of a chemical source gas containing said material and a carrier gas through a first longitudinal passageway having a predetermined distance in a first zone of said chamber;

providing at said input section a longitudinal substantially laminar flow of a second gas stream through said chamber along a path in a second longitudinal passageway having the same said predetermined distance and isolated from but substantially parallel to said first passageway carrying said first gas stream through said first longitudinal zone of said chamber;

moving substrates at a rate of about 0.5 feet/minute serially and longitudinally through said chamber adjacent only to said second gas stream in said isolated passageway and in a path substantially parallel to said first and second passageways;

diffusing in a second longitudinal zone of said chamber said first gas stream into said second stream at the end of said first zone to effect epitaxial deposition of the silicon material from said first stream on the surface of said substrates such that the epitaxial deposition rate resulting from said diffusion at the entrance and exit portions of said second zone is less than the epitaxial deposition rate in the intermediate portion of the second zone;

heating to a predetermined temperature said substrates before passing into said second zone;

balancing the forward momentums of the first and second gas streams to be substantially equal and to thereby reduce turbulent flow of the gas streams towards a minimum as they diffuse together subsequent to passing through their said respective passageways for said predetermined distance; and

passing said substrates through a third passageway in a third longitudinal zone while passing a stream of purging gas through said third passageway, said second gas stream and said purging gas stream serving to provide a viscous seal at the input section and output section of said chamber;

the first, second and third longitudinal zones extending along chamber axis whereby the substrates and gases are moved longitudinally substantially linearly along said longitudinal axis through said chamber;

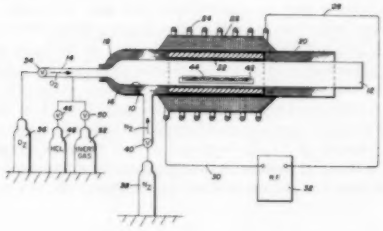
whereby a significantly large throughput of substrates deposited with said material to a substantially uniform thickness can be achieved at a high rate as the turbulence of said respective gas streams is reduced to a minimum.

4,430,150

PRODUCTION OF SINGLE CRYSTAL SEMICONDUCTORS

Jules D. Levine, Dallas; William R. McKee, Plano, and Kent R. Carson, McKinney, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Aug. 7, 1981, Ser. No. 290,917
Int. Cl.³ C30B *29/60*
U.S. Cl. 156—616 A **17 Claims**



1. The method comprising:

(a) treating a polycrystalline semiconductor material in a reactive gaseous environment to form a skin thereon of a thermally stable compound;

(b) thereafter melting the material within said skin while in said gaseous environment with the molten material retained within said skin; and

(c) cooling the material to form a solid single crystal body within said skin.

4,430,151

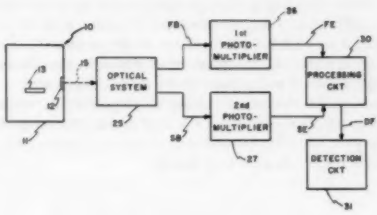
METHOD OF MONITORING STATUS OF A SILICON LAYER BY DETECTING, EMISSION SPECTRA VARIABLE DURING ETCHING

Tsutomu Tsukada, Tokyo, Japan, assignor to Anelva Corporation, Tokyo, Japan

Filed Jun. 9, 1983, Ser. No. 502,461
Claims priority, application Japan, Jun. 11, 1982, 57-100415
Int. Cl.³ H01L *21/306*; C03C *15/00, 25/06*; B44C *1/22*
U.S. Cl. 156—626 **13 Claims**

1. A method for use in etching a layer of silicon by plasma in a chlorine including gas filled in a hollow space, to distinguish between a first and a second duration which said layer is being etched and not, respectively, said plasma producing CCl- and OH-radicals whch result from said chlorine including gas and from water remaining as a remnant in said hollow space, respectively, said method coprising the steps of:

selecting emission spectra which result from a preselected one of said CCl- and said OH-radicals and which are variable in



intensity at a transition time instant between said first and said second durations; and

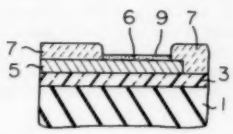
monitoring said intensity of said emission spectra to detect said transition time instant and to, thereby, distinguish between said first and said second durations.

4,430,152

PROCESS FOR FABRICATING A SEMICONDUCTOR DEVICE

Takashi Okano, Tokyo, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Oct. 21, 1982, Ser. No. 435,746
Claims priority, application Japan, Oct. 23, 1981, 56-169766
Int. Cl.³ B44C *1/22*; C03C *15/00, 25/06*
U.S. Cl. 156—643 **8 Claims**



1. A process for fabricating a semiconductor device having a semiconductor substrate, comprising the steps of:

(a) forming a metal layer on the semiconductor substrate;

(b) forming a phosphosilicate glass layer on the metal layer;

(c) dry etching a part of the phosphosilicate glass layer to expose a portion of the metal layer; and

(d) treating the exposed portion of the metal layer with an alkaline solution.

4,430,153

METHOD OF FORMING AN RIE ETCH BARRIER BY IN SITU CONVERSION OF A SILICON CONTAINING ALKYL POLYAMIDE/POLYIMIDE

Robert T. Gleason, Burlington, and Harold G. Linde, Richmond, both of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 30, 1983, Ser. No. 509,516
Int. Cl.³ H01L *21/306*; C23F *1/02*; B44C *1/22*; C03C *15/00*
U.S. Cl. 156—643 **1 Claim**

1. A method of forming an etch barrier in the reactive ion etching of an aromatic polyamic acid/imide which comprises:

coating a surface with a layer of an aromatic polyamic acid;

at least partially curing the layer of aromatic polyamic acid to the corresponding aromatic polyimide;

in situ converting the surface layer of the aromatic polyimide to a silicon containing alkyl polyamide/imide;

applying, exposing, and developing a layer of photoresist over the silicon containing alkyl polyamide/imide to

selectively expose a portion of the silicon containing alkyl polyamide/imide surface layer;

reactive ion etching the exposed portion of the surface layer of the silicon containing alkyl polyamide/imide with carbon tetraflouride to remove the exposed portion of the silicon containing alkyl polyamide/imide surface layer;

reactive ion etching the resultant structure with an oxygen agent to etch an interconnect in the aromatic polyimide while removing the photoresist down to the silicon containing alkyl polyamide/imide surface layer; and

reacting the silicon containing alkyl polyamide/imide surface layer exposed upon removal of the photoresist by the oxygen reactive ion etching to thereby convert the same to a silicon dioxide etch barrier.

4,430,154

METHOD OF PRODUCING PRINTED CIRCUIT BOARDS

Fritz Stahl, Tönisvorst, and Horst Steffen, Geldern-Pont, both of Fed. Rep. of Germany, assignors to Kollmorgen Technologies Corporation, Dallas, Tex.

Filed Mar. 15, 1982, Ser. No. 358,226

Claims priority, application Fed. Rep. of Germany, Mar. 18, 1981, 3110413

Int. Cl.³ B44C *1/22*; **C03C** *15/00, 25/06*; **B29C** *17/08*

U.S. Cl. 156—651 **11 Claims**

1. In a method for making printed circuit boards by the full- or semi-additive process on an adhesive coated surface of a base material in which the conductors are made first on the adhesive coated surface in the manner known, the improvement comprising the step of removing the adhesive coating on the base material between the conductors without substantially attacking the base material and the conductors thereon by treating said printed circuit board with said adhesive coated surface and said conductors thereon with a solution selected from the group consisting of an alkaline permanganate and a chromic acid and thereafter washing said treated board.

4,430,155

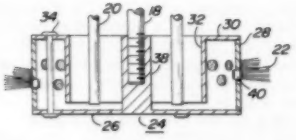
PRODUCTION OF MACROSPHERICAL PARTICLES

James F. Kozischek, Belvidere, and M. Donner Martin, Jr., Denville, both of N.J., assignors to Armour Pharmaceutical Company, Berkeley Heights, N.J.

Continuation of Ser. No. 226,311, Jan. 21, 1981, abandoned. This application Jun. 15, 1982, Ser. No. 388,576

Int. Cl.³ B01D *1/18, 1/20*; **B05B** *1/34, 3/10*

U.S. Cl. 159—4 S **8 Claims**



1. A process for producing dry, thick-walled macrospherical particles of controlled particle size distribution comprising providing a solution from a generally centrally located source, said solution containing material from which said particles are made, dispersing said solution outwardly along a plurality of radially disposed bristles by centrifugal force to form discrete liquid droplets and drying said droplets in a stream of heated gas to form said particles after said droplets leave the free ends of said bristles.

4,430,156

PROCESS FOR DRYING PUMPABLE SUSPENSIONS

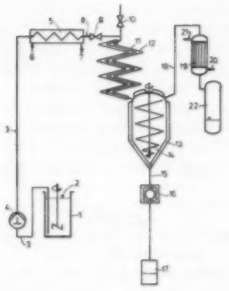
Clemens Casper, Krefeld; Dieter Grenner, Dormagen; Gerd-Rüdiger Klette, Krefeld, and Edzard Tholema, Odenthal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 6, 1981, Ser. No. 290,444

Claims priority, application Fed. Rep. of Germany, Aug. 13, 1980, 3030662

Int. Cl.³ B01D *1/02*

U.S. Cl. 159—47.1 **5 Claims**



1. A process for drying pumpable suspensions or crystal solutions in which the liquid having a solids content of up to 50% by weight is evaporated during transport by the indirect application of heat accompanied by the release of pressure, characterised in that, in a multiphase flow tube, in which the ratio of circumference to cross-sectional area is from 0.05 to 1.5 [mm^{-1}], and with a throughput of from 2 to 50 kg/h per square centimeter of cross-sectional area, any plug-like deposits in the tacky paste-to-solid transitional zone subjected to intense heating are sheared off from the wall of the flow tube by brief increases in pressure of from 0.5 to 10 bars beyond the system pressure of 5 to 20 bars, and in that the moisture still present in the solid particles is then removed by evaporation in the flow tube to a residue of 0.1% by weight.

4,430,157

CALCINED SERPENTINE AS INORGANIC CHARGE IN SHEET MATERIALS

Jean M. Lalancette, 470 Duvernay St., Sherbrooke, Quebec, Canada

Continuation-in-part of Ser. No. 251,913, Apr. 7, 1981, abandoned. This application Mar. 11, 1983, Ser. No. 474,455

Int. Cl.³ D21H *5/18*

U.S. Cl. 162—145 **8 Claims**

1. An improved non-woven fibrous base felt which comprises a solid homogeneous sheet of a mixture of from about 2% to about 40% by weight of fibrous material, from about 10% to about 80% of the partially fibrous agglomerates devoid of asbestos fibers, free of magnesium oxide not bonded to silica and containing crystalline forsterite as the main constituent, the remainder being amorphous silica or a mixture of crystalline enstatite and amorphous silica obtained by calcination of asbestos tailings, at least 85% of which having a granulometry of between −60 to about +400 mesh and from about 2% to about 25% by weight of an organic binder, said felt being characterized by the total absence of asbestos fibers coming from the agglomerate.

4,430,158

METHOD OF IMPROVING THE WET TENSILE STRENGTH OF GLASS FIBER MATS

Philip A. Jackey, Manville, and V. Robert Canfield, Martinsville, both of N.J., assignors to GAF Corporation, New York, N.Y.

Filed Sep. 14, 1981, Ser. No. 301,663
Int. Cl.³ D21H 5/18
U.S. Cl. 162—156 10 Claims

1. A method of making a glass fiber mat having improved wet tensile strength properties comprising:

(a) forming a plurality of enmeshed sized glass fibers in a wet-laid process,

(b) adding a binder composition consisting essentially of urea-formaldehyde and a surfactant for said thus-formed mat, said surfactant being highly water soluble and capable of wetting the surfaces of the sized glass fibers and being selected from the group consisting of anionic surfactants, said anionic surfactants having hydrophobic segments containing from 8 to 30 carbon atoms and anionic segments selected from among carboxy, sulfate ester, phosphate ester, sulfonic acid and phosphonic acid groups; and

(c) drying the glass mat having the binder thereon.

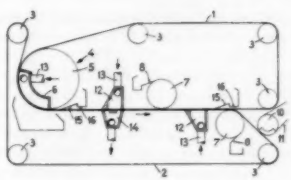
6. Glass fiber mat made according to the method of claim 1.

4,430,159

TWIN-WIRE PAPERMAKING MACHINE

Alfred Bubik, Ravensburg, and Siegfried Reutter, Gerbertshaus, both of Fed. Rep. of Germany, assignors to Escher Wyss Limited, Ravensburg, Fed. Rep. of Germany

Filed Apr. 9, 1982, Ser. No. 367,076
Claims priority, application Switzerland, Apr. 27, 1981, 2727/81
Int. Cl.³ D21F 1/00
U.S. Cl. 162—292 11 Claims



1. A twin-wire papermaking machine comprising:

two wires extending essentially parallel to one another and moving essentially at the same speed;

at least one stock infeed means for the pressurized infeed of a fiber stock suspension at above atmospheric pressure between both of the wires through one of said wires in order to form a paper ply between the two wires from the infed fiber stock suspension;

means for guiding said wires so as to be in mutual contact with one another at least at the region of the stock infeed means;

said stock infeed means possessing the form of a box member having an open side along which move both of the wires; and

said stock infeed means has a guide surface at the open side thereof which is in guiding contact with one of the two wires located adjacent thereto in order to press said one wire against the other wire.

4,430,160

PROCESS FOR ENHANCING THE THERMAL DECOMPOSITION OF SOLID MATTER

Joel DuBow, 195 Berkeley Pl., Brooklyn, N.Y. 11217

Filed Jan. 25, 1982, Ser. No. 342,568
Int. Cl.³ C01G 49/02; C07C 4/04; C10B 57/00; C10J 3/18
U.S. Cl. 201—19 7 Claims

1. A process for thermally decomposing non-living solid matter comprising:

applying a direct current electrical field of about 1000 volts/centimeter or greater and of an amperage of about 0.001 amp/square centimeter or less across said solid matter;

simultaneously heating said solid matter using heating means other than said electrical field until said solid matter at least partially thermally decomposes, whereby amount of thermal energy required to carry out said at least partial decomposition is reduced by the application of said electrical field and

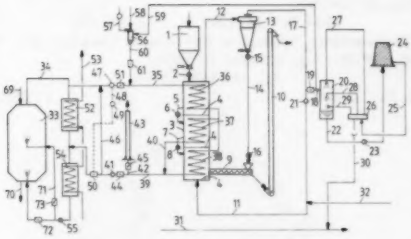
separating off one or more components of said at least partially decomposed matter.

4,430,161

CASCADED COAL DRIER FOR A COKING PLANT

Vladan Petrovic; Karl Schmid; Friedrich Jokisch, and Heinz Rotthaus, all of Essen, Fed. Rep. of Germany, assignors to Krupp-Koppers GmbH, Essen, Fed. Rep. of Germany

Filed May 10, 1982, Ser. No. 376,843
Claims priority, application Fed. Rep. of Germany, May 13, 1981, 3118931
Int. Cl.³ C10B 39/02, 57/10
U.S. Cl. 202—228 4 Claims



1. In combination, a coking plant including means for preheating and drying coal to be charged into at least one coking oven, and means for dry cooling by a gaseous cooling medium hot coke after its discharge from the coking oven, whereby heat exchange between the hot coke and the coal to be preheated is effected by recirculating gas and steam generated during the cooling process between said preheating means and said dry cooling means, and multi-stage cascaded drier arranged in said preheating and drying means for receiving in its uppermost cascade coal to be preheated and for discharging the coal at its lowermost cascade, said cascaded drier including in each cascade a gas distributing box and an opposite gas collecting box, an array of parallel-connected and substantially horizontally oriented heating pipes interconnecting said boxes, and said heating pipes in the uppermost cascade having larger diameters than the pipes in the underlying cascades.

4,430,162
PROCESS FOR PURIFICATION OF CRUDE ACETONITRILE

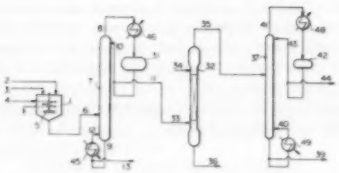
Terumasa Higuchi, Yokohama, and Hiroshi Susumago, Chigasaki, both of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 131,611, Mar. 19, 1980, Pat. No. 4,308,108. This application Aug. 3, 1981, Ser. No. 289,628

Claims priority, application Japan, Mar. 28, 1979, 54-36577; Apr. 26, 1979, 54-51978; Apr. 26, 1979, 54-51979; May 18, 1979, 54-61288

Int. Cl.³ B01D *3/34*

U.S. Cl. 203—37 7 Claims



1. A process for purifying crude acetonitrile containing water as a major component, which comprises the steps of:

treating the crude acetonitrile with from 10 to 50% of an alkali based on the weight of the water present in the crude acetonitrile, at a predetermined temperature and for a predetermined time such that no substantial hydrolysis of acetonitrile takes place, sufficient to divide the crude acetonitrile into an organic liquid phase, and then removing the aqueous liquid phase.

4,430,163
PROCESS FOR THE CONTINUOUS SEPARATION OF SLIGHTLY VOLATILE COMPONENTS FROM A CRUDE PHTHALIC ACID ANHYDRIDE

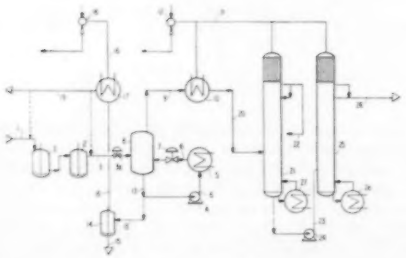
Manfred Albers, Dortmund; Gerhard Keunecke, Geyen, and Herbert Krimphove, Pulheim, all of Fed. Rep. of Germany, assignors to Davy McKee Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Dec. 16, 1981, Ser. No. 331,234

Claims priority, application Fed. Rep. of Germany, Dec. 17, 1980, 3047489; Aug. 22, 1981, 3133310

Int. Cl.³ B01D *3/06*

U.S. Cl. 203—75 17 Claims



1. In a process for the purification of a crude phthalic acid anhydride that contains slightly volatile impurities and is produced by oxidation of naphthalene, which process includes

(a) subjecting said crude phthalic acid anhydride to a thermal pretreatment;

(b) subjecting the thermally-pretreated crude phthalic acid anhydride to a first distillation in a flash evaporator to produce a distillate with elevated content of phthalic anhydride and a residue which contains slightly volatile impurities;

(c) subjecting the distillate to rectification to obtain a purified phthalic acid anhydride; the improvements which comprise;

(d) removing residue from the first distillation and compressing a first portion of the residue to a pressure of from 1 to 5 bar and heating the residue to a temperature below the boiling point under the prevailing pressure;

(e) recirculating the heated compressed residue to said first distillation in the flash evaporator; and

(f) subjecting a second portion of the residue to residue distillation in a residue distillation vessel said second portion being of sufficient magnitude to reduce the formation of deposits on evaporator heating surfaces during rectification of the distillate.

4,430,164
FAULT-COMPENSATING ELECTRO-ANALYTICAL MEASURING PROCESS AND EQUIPMENT

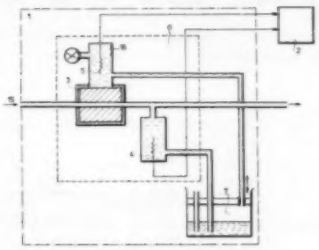
Janos Daroczy; Janos Erdelyi; Jeno Havas; Lajos Kecskes, and Henrik Müller, all of Budapest, Hungary, assignors to Radelkis Elektrokemiai Müszergyarto Szövetkezet, Budapest, Hungary

Filed Mar. 1, 1982, Ser. No. 353,290

Claims priority, application Hungary, Mar. 26, 1981, 758

Int. Cl.³ G01N *27/30*

U.S. Cl. 204—1 T 5 Claims



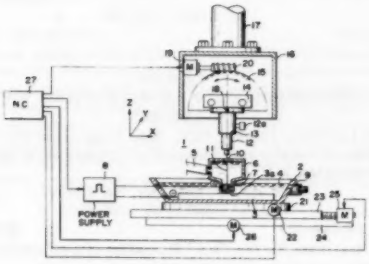
1. In an electro-analytical measuring process wherein a measuring chain comprising at least one sensing element and reference electrodes is provided, the improvement comprising the steps of periodically galvanically short-circuiting at least one part of the measuring chain by a fluid clutch with an electrically conductive electrolyte and fault compensating the measuring signals obtained from the measuring chain when not short-circuiting with the measuring signals obtained during the short-circuiting thereof.

2. An electro-analytical measuring apparatus for the selective, rapid and high-precision determination of concentration, ion-activity of stationary or flowing solutions or of partial pressure of gases, comprising: a measuring cell and an electronic signal processor connected to the measuring cell, wherein the measuring cell comprises a measuring chain having at least one sensing element and reference electrodes and at least one means for galvanically short-circuiting at least one part of the measuring chain, the means comprising a fluid clutch having an electrically conductive electrolyte.

4,430,165
LASER-ACTIVATED ELECTRODEPOSITING METHOD AND APPARATUS

Kiyoshi Inoue, Tokyo, Japan, assignor to Inoue-Japax Research Incorporated, Yokohama, Japan

Filed Jul. 23, 1982, Ser. No. 401,247
Claims priority, application Japan, Jul. 24, 1981, 56-115369; Aug. 17, 1981, 56-127742; Apr. 7, 1982, 57-56494
Int. Cl.³ C25O *5/02, 17/00*
U.S. Cl. 204—15 **27 Claims**



1. A method of electrodepositing a metal in a continuous layer of a uniform thickness onto a workpiece of an intricate surface contour, comprising the steps of:

(a) passing an electric current between an electrode and the workpiece in the presence of a metal electrodepositing solution flowing therebetween;

(b) directing a narrow thermal energy beam towards the surface of the workpiece to cause the beam to be incident upon a localized area thereon, thereby activating an interface between said area and said flowing solution to allow said metal to be electrodeposited therefrom selectively onto said area;

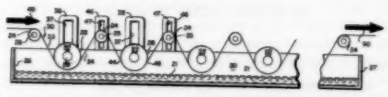
(c) relatively displacing said incident beam and said workpiece generally translationally in a scanning manner such as to shift said localized beam incidence continuously over a desired surface region on the workpiece surface whereby said metal is progressively electrodeposited in the continuous layer on said surface region; and

(d) increasing the uniformity of the thickness of said layer of electrodeposition by controlling at least one of the parameters: the rate of said displacement between the incident beam and the workpiece, the diameter and energy of the incident beam, the electrical parameters of said electric current and the rate of flow of said solution flowing between the electrode and the workpiece, as a function of the instantaneous position of the workpiece displaced relative to said incident beam in step (c).

4,430,166
METHOD AND APPARATUS FOR ELECTRO-TREATING A METAL STRIP

William A. Carter, Munster, Ind., assignor to Inland Steel Company, Chicago, Ill.

Filed Sep. 27, 1982, Ser. No. 424,858
Int. Cl.³ C25D *5/02, 17/00, 17/10*
U.S. Cl. 204—15 **83 Claims**



1. An apparatus for electro-treating a continuous metal strip advancing in a downstream direction, said strip having a pair of side edges and a pair of opposed flat surfaces, said apparatus comprising the following structure:

a cylindrical roll having an outer surface composed of electrically conductive material;

a layer of mesh on said outer surface of the roll;

said mesh being composed of electrically insulating material;

said roll outer surface and said mesh defining a multiplicity of non-communicating open-end sites each having an inner base defined by a part of said roll outer surface, site-enclosing side walls defined by a part of said mesh and an open outer end opposite said base;

means for wrapping a portion of a continuous metal strip around a substantial portion of said roll to close the sites on that portion of the roll and to provide a pair of spaced-apart nips between said strip and said roll at the locations of initial upstream and final downstream contact between the strip and the roll;

said mesh layer comprising means for preventing direct electrical contact between said strip and said outer roll surface;

means for advancing said metal strip in a downstream direction and for simultaneously rotating said roll while maintaining the wrapped-around relationship between the strip and the roll and avoiding relative movement between (a) said strip and (b) said roll outer surface and mesh layer thereon, during said wrapped-around relationship;

means for introducing an electrolytic liquid onto the outer surface of the roll to flood the sites closed by said strip as the strip advances and the roll rotates;

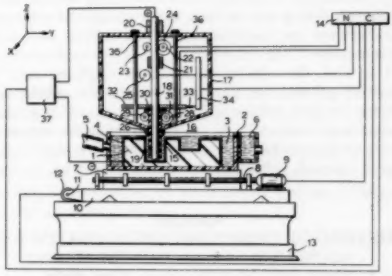
means for charging said outer surface of the roll with a charge having a first polarity;

and means for charging said strip with a charge having a second polarity opposite said first polarity.

4,430,167
METHOD OF AND APPARATUS FOR ELECTRODEPOSITING A METAL ON A SUBSTRATE

Kiyoshi Inoue, Tokyo, Japan, assignor to Inoue-Japax Research Incorporated, Yokohama, Japan

Filed Aug. 5, 1982, Ser. No. 405,604
Claims priority, application Japan, Aug. 7, 1981, 56-122939; Sep. 10, 1981, 56-141661; Sep. 11, 1981, 56-142402
Int. Cl.³ C25D *5/04, 7/04, 17/00*
U.S. Cl. 204—25 **22 Claims**



1. A method of electrodepositing a metal on an uneven substrate having at least one recess of substantial depth to form a metal deposit throughout surfaces within the recess the method comprising the steps of:

(a) passing an elongate anode through a tubular insulator to provide an electrode assembly;

(b) positioning said electrode assembly relative to said substrate to dispose a forward end portion of said assembly in said recess and positioning said insulator on said elongate anode so as to allow only a forward end face portion of the anode to be substantially exposed from said insulator

and said face portion to be juxtaposed with a floor portion of the substrate in said recess;

(c) supplying an electrodepositing solution to said recess and passing an electric current between said anode and said substrate while maintaining the positional relationship achieved in step (b) to permit the metal from the solution to be at least preferentially electrodeposited on said floor portion;

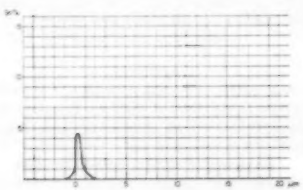
(d) subsequent to step (c), continuing supply of said solution and passage of said electric current while substantially maintaining the position of said elongate anode established in step (b) and gradually withdrawing said tubular insulator to progressively increase the lateral area of said elongate anode exposed from said insulator, thereby progressively displacing the region of electrodeposition on the wall surface in said recess; and

(e) subsequent to step (d), withdrawing said elongate anode from said recess.

4,430,168
PROCESS FOR ELECTROLYTICALLY COLORING ALUMINIUM AND THE ALLOYS THEREOF

Jose L. Gazapo Santa-Olalla; Juan Gonzalez Feliu, both of Alicante, and Isidoro de Miguel Lopez, Albufereta, all of Spain, assignors to Empresa Nacional del Aluminio, S.A., Madrid, Spain

Filed Apr. 20, 1981, Ser. No. 255,665
Claims priority, application Spain, Apr. 22, 1980, 490,784
Int. Cl.³ C25D *11/22*
U.S. Cl. 204—35 N **4 Claims**



1. In a process for electrolytically colouring aluminum or an alloy thereof, comprising the sequential steps of anodizing, colouring, and fixing, the improvement wherein the colouring step is conducted in an electrolyte comprising sulfuric acid and a color-producing salt or salts under conditions wherein the ratio between the concentration of the sulfuric acid and the concentration of the color-producing salt or salts used is from 70:1 to 15:1, the concentration of the sulphuric acid being above 15 g/l and the salts used being metal sulphates, and wherein the peak voltage applied is from 10 to 45 volts and the temperature is about 25° C., and wherein at the beginning of the colouring step of the process the voltage is increased from 0 up to the peak voltage in a progressive manner.

4,430,169
METHOD OF PRODUCING GREEN COATINGS ON ALUMINUM AND ALUMINUM ALLOYS

Jack L. Woods, 1517 Ninth St., Ogden, Utah 84404

Filed Mar. 4, 1982, Ser. No. 354,528
Int. Cl.³ C25D *11/22*
U.S. Cl. 204—35 N **10 Claims**

1. A process for producing a green colored coating on aluminum or aluminum alloys comprising the steps of:

anodizing the aluminum or aluminum alloy article to form an anodic coating thereon;

passing an alternating current between an electrode system comprising the previously anodized aluminum or aluminum alloy article and a counter electrode, while said electrode system is immersed in an aqueous, acidic bath comprising from about 0.2 to 0.4 grams per liter of a soluble silver salt, whereby the anodic coating on said anodized article is colored yellow; and

immersing the yellow colored, anodized article in a dye bath containing a lightfast blue dye, whereby the yellow colored anodic coating on said anodized article is converted to a green color.

4,430,170
ELECTRODEPOSITION OF REFRACTORY METAL CARBIDES

Kurt H. Stern, Takoma Park, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 17, 1983, Ser. No. 458,597
Int. Cl.³ C25D *3/66, 9/08, 9/10*
U.S. Cl. 204—39 **20 Claims**

1. A process for the electrodeposition of a refractory metal carbide upon the surface of an object, the steps of which comprise:

preparing an essentially pure alkali fluoride melt in an inert container;

adding carbonate ions to said melt in the form of alkali carbonate:

adding the refractory metal, the carbide of which is desired to be coated upon said object, to said alkali fluoride melt in the form of a soluble, metal-containing compound;

immersing the elemental form of the refractory metal in said melt as an anode electrode;

immersing the object desired to be coated into said melt as a cathode electrode;

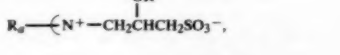
applying a voltage across said electrodes until said cathode has the desired thickness of coating of said carbide of said refractory metal upon its surface.

4,430,171
ELECTROPLATING BATHS FOR NICKEL, IRON, COBALT AND ALLOYS THEREOF

Kenneth W. Lemke, Englishtown, and Maynard W. McNeil, Washington, both of N.J., assignors to M&T Chemicals Inc., Woodbridge, N.J.

Filed Aug. 24, 1981, Ser. No. 295,349
Int. Cl.³ C25D *3/18, 3/56*
U.S. Cl. 204—43 T **7 Claims**

1. A plating bath for the electrodeposition of metal comprising an aqueous solution of at least one metal salt selected from salts of nickel, iron and cobalt, characterized by the presence of a brightening agent of the formula



wherein

$\overset{+}{N}$ is a heterocyclic tertiary amine group,

R is a halogen or lower alkyl group,

R′ is hydrogen, lower alkyl or a R″C(O)—group,

R″ is a lower alkyl group and a is 0–5.

4,430,172

METHOD OF INCREASING CORROSION RESISTANCE IN GALVANICALLY DEPOSITED PALLADIUM/NICKEL COATINGS

Robert Brugger, Filderstadt, and Klaus Schulze-Berge, Remscheid, both of Fed. Rep. of Germany, assignors to Langbein-Pfanhauser Werke AG, Fed. Rep. of Germany

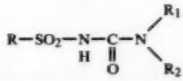
Continuation-in-part of Ser. No. 406,956, Aug. 10, 1982, abandoned. This application Sep. 28, 1982, Ser. No. 426,081

Claims priority, application Fed. Rep. of Germany, Sep. 11, 1981, 3136003

Int. Cl.³ C25D *3/56*

U.S. Cl. 204—43 N **9 Claims**

6. In an electroplating bath for the electrodeposition of a palladium/nickel coating which comprises an aqueous solution containing 5 to 30 g/liter each of palladium and nickel in the form of respective ammines with the palladium and nickel in a ratio corresponding to the composition of the coating deposited and such that the coating contains 30 to 90% by weight palladium, the improvement which comprises 0.1 to 10 g/liter of a sulfonyl urea in said solution, said sulfonyl urea having the formula



wherein R is phenyl, tolyl, hydroxyphenyl, naphthyl or a nitrogen-containing heterocycle and R_1 and R_2 are the same or different and each is hydrogen or lower alkyl.

4,430,173

ADDITIVE COMPOSITION, BATH AND PROCESS FOR ACID COPPER ELECTROPLATING

Bernard Boudot, Paris; Georges Nury, Frepillon, and Andre Lambert, Louvres, all of France, assignors to Rhone-Poulenc Specialties Chimiques, Courbevoie, France

Filed Jul. 16, 1982, Ser. No. 398,805

Claims priority, application France, Jul. 24, 1981, 81 14394

Int. Cl.³ C25D *3/38*

U.S. Cl. 204—52 R **12 Claims**

1. An additive composition for an acid copper electroplating bath, comprising (1) the sodium salt of ω-sulfo-n-propyl N,N-diethyldithiocarbamate, (2) polyethylene glycol having an average molecular weight ranging from about 6,000 to 20,000, (3) crystal violet, and (4) sulfuric acid.

6. In an acid copper electroplating bath, the improvement which comprises, as an additive composition therefor, the additive composition as defined by claim 1.

4,430,174

METHOD FOR REFINEMENT OF IMPURE ALUMINUM

Yoshishige Tsumura, 39-7 Minami-Magome 1 chome, Ohta-ku, Tokyo, Japan, assignor to Mitsui Aluminium Co., Ltd. and Yoshishige Tsumura, both of Tokyo, Japan

Filed Nov. 30, 1982, Ser. No. 445,717

Claims priority, application Japan, Dec. 1, 1981, 56-191704

Int. Cl.³ C25C *3/06*

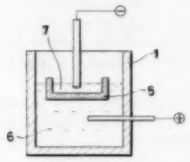
U.S. Cl. 204—67 **11 Claims**

1. A method for refining impure aluminum, which comprises:

(a) placing said impure aluminum in a molten form into a container on one side of a porous article impregnated with a fused-salt electrolytic bath containing at least one metal selected from the group consisting of alkali metals and alkaline earth metals with electrical connection being made to said impure molten aluminum so that if serves as an anode;

(b) disposing a cathode of molten aluminum on the remaining side of said impregnated porous article;

(c) passing direct current between said cathode and said anode with the result that chlorine gas is generated in said porous article which reacts with impurities in said molten impure aluminum functioning as an anode, thereby forming chloride salts which migrate across said porous article and accumulate in the molten aluminum cathode; and



(d) recovering refined aluminum from the container of step (a).

4,430,175

PROCESS FOR THE ELECTROCHEMICAL CONVERSION OF COAL AND USE OF THE REACTION PRODUCTS

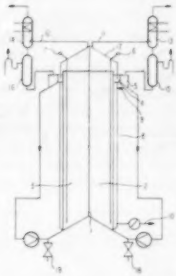
Gerhard Kreysa, Wehrheim, and Gerd Collin, Duisburg, both of Fed. Rep. of Germany, assignors to Rütgerswerke Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Dec. 15, 1982, Ser. No. 449,952

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1981, 3150729

Int. Cl.³ C25B *3/00, 3/02*

U.S. Cl. 204—72 **10 Claims**



1. A process for the electrochemical conversion of coal comprising forming a finely divided coal suspension in a dilute mineral acid solution in an electrolyte cell, alternately subjecting said suspension to anodic and cathodic polarization to thereby obtain a change in the chemical composition of the coal as may be determined by an elemental analysis of the coal before and after electrolysis.

4,430,176

ELECTROLYTIC PROCESS FOR PRODUCING HYDROGEN PEROXIDE

John B. Davison, Mission Viejo, Calif., assignor to Occidental Chemical Corporation, Niagara Falls, N.Y.

Filed Nov. 13, 1981, Ser. No. 321,286

Int. Cl.³ C25B *1/30*

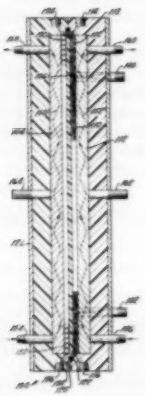
U.S. Cl. 204—84 **5 Claims**

1. An electrolytic process for producing hydrogen peroxide in an aqueous alkaline solution comprising:

(a) simultaneously passing an aqueous alkaline electrolyte and oxygen through a fluid permeable cathode comprising reticulated vitreous carbon foam;

(b) separating said fluid permeable cathode from an anode by a barrier wall; and,

(c) connecting said fluid permeable cathode and said anode with an external power source for causing the electrical



current density on the fluid permeable cathode to be at least 400 amperes per square meter and generating hydrogen peroxide ion within the aqueous alkaline solution, at a current efficiency of at least 85 percent.

4,430,177

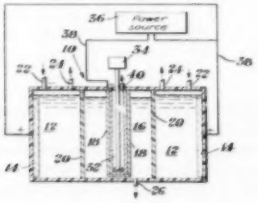
ELECTROLYTIC PROCESS USING OXYGEN-DEPOLARIZED CATHODES

James A. McIntyre; Robert F. Phillips, both of Midland, and Joseph D. Lefevre, Bay City, all of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 102,481, Dec. 11, 1979, Pat. No. 4,340,459, which is a continuation-in-part of Ser. No. 939,588, Sep. 5, 1978, abandoned. This application Apr. 22, 1982, Ser. No. 370,776

Int. Cl.³ C25B *1/16, 1/24, 11/03, 11/08*

U.S. Cl. 204—98 **17 Claims**



1. A process for generating halogens and alkali metal hydroxide which comprises electrolyzing an aqueous alkali metal halide between a pair of electrodes separated by an ion exchange membrane or diaphragm, at least one of the electrodes having

a first electrically conductive, catalytically active porous layer having a plurality of interconnecting passageways therethrough with diameters of from about 7 to about 12 microns and of a size sufficient to permit an oxidizing gas to permeate therethrough, and

a second electrically conductive, catalytically active porous layer having a plurality of interconnecting passageways therethrough with diameters of from about 0.1 to about 3 microns and of a size sufficient to minimize said oxidizing gas from permeating therethrough, the layers being joined into a wall structure in a manner so that at least a portion of the passageways of the first layer interconnect with the passageways of the second layer;

said wall being in the shape of a pocket, wherein at least a portion of an inner surface of the pocket is a surface of the first layer and at least a portion of an outer surface of the pocket is a surface of the second layer.

4,430,178

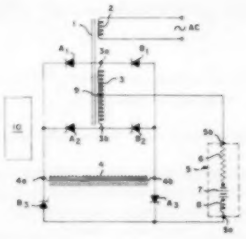
METHOD AND APPARATUS FOR EFFECTING CURRENT REVERSAL IN ELECTRO-DEPOSITION OF METALS

Harold J. T. Anderson, Oakville; Robert C. Kerby, Rossland; . Clifford J. Krauss, Trail, and Hubert W. Neame, Mississauga, all of Canada, assignors to Cominco Ltd., Canada

Filed May 24, 1982, Ser. No. 381,725

Int. Cl.³ C25C *1/18*

U.S. Cl. 204—114 **18 Claims**



1. A method for effecting periodic reversal of the polarity of the electrical current in a process for the electro-deposition of a metal, consisting of passing a controlled direct current between a multiplicity of electrodes including at least one cathode and at least one anode, immersed in an electrolyte in an electrolytic cell, which method comprises:

(i) rectifying an alternating electric current by passing the alternating current through rectifier means;

(ii) filtering the rectified current by passing it through a filter reactor;

(iii) passing the filtered rectified current to the electro-deposition process;

(iv) controlling the polarity of the current provided by the rectifier means to the electro-deposition process by a control means; and

(v) periodically ordering the control means to reverse the polarity of the current passing through the electro-deposition process for desired periods of time without changing the polarity of the current passing through the filter reactor.

4,430,179

PORTABLE METHOD FOR FILTER PRESS CELL ASSEMBLY

James M. Ford, and David B. Wright, both of Cleveland, Tenn., assignors to Olin Corporation, New Haven, Conn.

Filed Aug. 3, 1981, Ser. No. 289,449

Int. Cl.³ C25B *1/26, 9/00, 15/08*

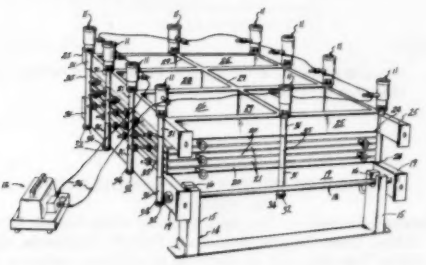
U.S. Cl. 204—128 **20 Claims**

12. A method of assembling a filter press type of electrolytic cell comprising the steps of:

(a) assembling a plurality of horizontally positioned electrodes in parallel side-by-side relationship; each adjacent pair of electrodes being sandwiched about a separator thereby forming a vertically rising stack, each electrode further having a periphery which cumulatively taken defines the periphery of the stack;

(b) placing a plurality of tightening means at selected locations about the periphery of the stack;

(c) connecting the tightening means to a tightening control means;
(d) activating the tightening control means to substantially simultaneously and substantially uniformly compress the stack via the tightening means at the selected locations;
(e) securing the compressed stack in its compressed state;
(f) deactivating the tightening control means to relieve the compression exerted via the tightening means while the stack is secured in its compressed state;
(g) disconnecting the tightening control means from the tightening means;



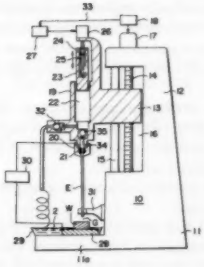
(h) removing the tightening means from the selected locations about the periphery of the cell;
(i) rotating the compressed vertical stack so that the horizontally positioned electrodes and the separators are positioned vertically in an assembled cell;
(j) connecting the vertically positioned assembled cell into an electrical circuit and to raw material supply lines and product withdrawal lines; and
(k) electrolytically operating the vertically positioned assembled cell.

4,430,180

APPARATUS FOR AND METHOD OF ELECTROEROSIVELY DRILLING A THIN HOLE IN A WORKPIECE

Akihiko Shimizu, Kawasaki, Japan, assignor to Japax Incorporated, Kanagawa, Japan

Filed Oct. 19, 1981, Ser. No. 312,663
Claims priority, application Japan, Oct. 21, 1980, 55-146356
Int. Cl.³ B23P *1/02, 1/12;* **B23K** *9/16*
U.S. Cl. 204—129.55 **16 Claims**



12. A method of electroerosively drilling a thin hole of a high depth-to-diameter ratio in a workpiece with a tubular electrode of corresponding high slenderness, comprising the steps of:
passing an electroerosive machining current between said tubular electrode and said workpiece across a machining gap flooded with a machining liquid delivered from the internal bore of the tubular electrode open to the machining gap;
relatively advancing said tubular electrode axially into said workpiece to progressively form said hole in the workpiece; and
delivering said machining liquid into said machining gap by:
providing a reservoir chamber communicating through an outlet opening thereof with said internal bore of the tubular electrode and a plunger member for operative reception in said chamber to be slidably movable therein longitudinally:
charging said chamber with a quantity of said machining liquid from a source thereof; and
relatively advancing said chamber and said plunger member received therein at a controlled rate of relative displacement to pressurize said charged machining liquid in the chamber with the plunger member, thereby causing said liquid to be progressively discharged out of the chamber and to be delivered through said internal bore at a regulated rate of flow to said machining gap.

4,430,181

PROCESS FOR THE PREPARATION OF BENZOYL CHLORIDE

Rainer Neumann; Karl Morgenstern; Karl-August Lipper; Friedrich Brühne; Walter Böckmann; Clemens Casper, and Siegfried Zingel, all of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Oct. 22, 1982, Ser. No. 436,108
Claims priority, application Fed. Rep. of Germany, Nov. 7, 1981, 3144316
Int. Cl.³ B01J *19/12;* **C07C** *63/10*
U.S. Cl. 204—158 HA **19 Claims**

1. A process for the preparation of benzoyl chloride, which comprises treating the high-boiling residue obtained in the catalytic oxidation of toluene with oxygen or an oxygen-containing gas in the liquid phase to largely free the same of heavy metal salts and thereafter chlorinating the resultant material, largely freed of heavy metal salts, at an elevated temperature and thereafter separating off benzoyl chloride.

4,430,182

MANUFACTURE OF DISPLAY ELECTRODE LAYERS IN ELECTROCHROMIC DISPLAY DEVICES

Tadanori Hishida, Kashihara; Hiroshi Kuwagaki, Joyo; Katubumi Koyanagi, and Yasuhiko Inami, both of Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Nov. 17, 1981, Ser. No. 322,243
Claims priority, application Japan, Nov. 21, 1980, 55-165201
Int. Cl.³ C23C *15/00*
U.S. Cl. 204—192 P **6 Claims**

1. A method for preparing display electrode layers in an electrochromic display device, comprising the steps of:
forming a transparent, conductive film on a substrate;
forming an insulating film over the entire surface of the transparent, conductive film;
forming a mask of inorganic resist at portions on the insulating film other than a display pattern and a lead-in electrode;
removing the insulating film at the display pattern and the lead-in electrode;
forming an electrochromic material layer over entire portions other than the lead-in electrode; and
removing the mask formed on the insulating film.

4,430,183

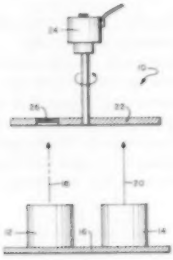
METHOD OF MAKING COHERENT MULTILAYER CRYSTALS

Ivan K. Schuller, and Charles M. Falco, both of Woodridge, Ill., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Division of Ser. No. 202,083, Oct. 30, 1980, abandoned. This application Sep. 27, 1982, Ser. No. 424,702

Int. Cl.³ C23C *15/00*

U.S. Cl. 204—192 C **6 Claims**



1. A process for forming a multilayer, superlattice crystal having parallel, ultrathin alternating layers of two different metal elements comprising:

placing a substrate suitable for epitaxial growth into a vacuum vessel;

removing the ambient gas from the vessel;

establishing a pressure of sputtering gas of at least 5×10^{-3} torr in the vessel;

heating the substrate to about 150° to 450° C.;

establishing two beams of sputtered atoms, one beam for each metal element of which the crystal is to be formed, the metals being elements which will grow epitaxially on each other;

adjusting the thermal energy of the atoms in each beam so that the temperature of the atoms as they reach the substrate, is about the temperature of the surface of the substrate, whereby the atoms in the beam do not displace or eject atoms in layers already deposited on the surface but grow epitaxially on the layers to form a superlattice crystal structure; and

alternately passing each beam of sputtered atoms over the the substrate to deposit alternate layers of the two metal atoms epitaxially on the surface and on each other, each layer being from 2 to 2500 angstroms in thickness, thereby forming a multilayer, superlattice crystal having parallel, ultrathin alternating layers of two different metal elements.

4,430,184

EVAPORATION ARC STABILIZATION

William M. Mularie, Stillwater, Minn., assignor to Vac-Tec Systems, Inc., Boulder, Colo.

Filed May 9, 1983, Ser. No. 492,831

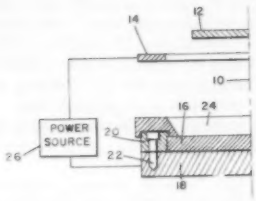
Int. Cl.³ C23C *15/00*

U.S. Cl. 204—192 R **30 Claims**

21. A method of evaporation arc stabilization comprising the steps of

establishing an arc on a surface of a target to evaporate the target, the arc being characterized by the presence of charged particles and a cathode spot which randomly migrates over said target surface; and

confining the arc to the target surface with a confinement ring which contacts and surrounds the target surface, the ring being composed of a material having (a) a secondary emission ratio less than one at the mean energies of the



charged particles of the arc and (b) a surface energy less than that of the evaporated target material.

4,430,185

METHOD OF PRODUCING PHOTOELECTRIC TRANSDUCERS

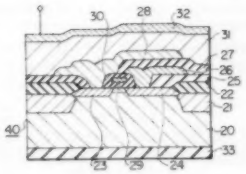
Yasuharu Shimomoto; Toshihisa Tsukada; Akira Sasano, all of Tokyo; Yasuo Tanaka, Kokubunji; Hideaki Yamamoto, and Yukio Takasaki, both of Hachioji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 20, 1981, Ser. No. 245,749

Claims priority, application Japan, Mar. 24, 1980, 55-36056

Int. Cl.³ C23C *15/00*

U.S. Cl. 204—192 P **21 Claims**



1. A method of producing a photoelectric transducer including depositing a photoconductive layer of amorphous hydrogenated silicon on a predetermined substrate having an irregular surface including non-flat portions, said predetermined substrate being a semiconductor substrate comprising at least an impurity-doped region, an electrode contacting at least part of said impurity-doped region, and a predetermined insulating material layer thereby constituting semiconductor switch elements and interconnections therebetween for a photoelectric transducer, in an atmosphere containing a plasma, comprising the steps of:

placing said predetermined substrate with an irregular surface on a first electrode such that said irregular surface is exposed, said first electrode constituting a holder for said predetermined substrate;

providing a second electrode as a target to oppose said first electrode; and

performing at least part of said depositing a photoconductive layer of amorphous hydrogenated silicon on the predetermined substrate with a negative bias potential of -5 V to -300 V being applied to said first electrode, and a ratio of power to be supplied to the substrate and the target being in the range of between 1/1 and 1/10, wherein the application of said negative bias voltage to said first electrode acts to sputter-etch a film deposited on said non-flat surface differentially from that on the flat surface to thereby produce a crack-free and pinhole-free photoconductive film of amorphous hydrogenated silicon on the substrate.

4,430,186

ELECTROLYTIC CELL WITH IMPROVED HYDROGEN EVOLUTION CATHODE

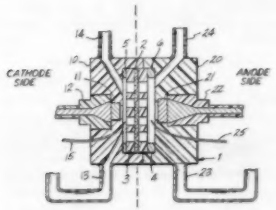
Thomas J. Gray, Guilford, Conn., assignor to Olin Corporation, New Haven, Conn.

Division of Ser. No. 380,155, May 20, 1982, which is a continuation-in-part of Ser. No. 301,681, Sep. 14, 1981, Pat. No. 4,374,712, which is a continuation-in-part of Ser. No. 80,745, Oct. 1, 1979, Pat. No. 4,289,650, which is a continuation-in-part of Ser. No. 25,153, Mar. 29, 1979, Pat. No. 4,240,895. This application Mar. 28, 1983, Ser. No. 479,296

The portion of the term of this patent subsequent to Feb. 22, 2000, has been disclaimed.

Int. Cl.³ C25B 9/00

U.S. Cl. 204—242 2 Claims



1. An electrolytic cell for generating hydrogen by passing an electric current through an aqueous electrolyte between the anode and a hydrogen evolution cathode, said cathode being comprised of a monolithic structure having a surface formed from an integral precursory, adherent Raney Beta phase quaternary alloy represented by the formula $Ni_xMo_yTi_zAl_3$, where x is the weight percent of nickel, y is the weight percent of molybdenum and z is the weight percent of titanium, in the combined weight of nickel, molybdenum and titanium, and where x ranges from about 75 to about 94 percent by weight, y ranges from about 20 to about 5 percent by weight and z ranges from about 5 to about 1 percent by weight, and which has had from about 75 to about 95 percent of the aluminum leached from said surface with a strong aqueous base so as to form an active porous Raney Beta phase nickel-molybdenum-titanium surface layer whereby the hydrogen overvoltage of said surface is reduced.

4,430,187

REDUCTION CELL POT

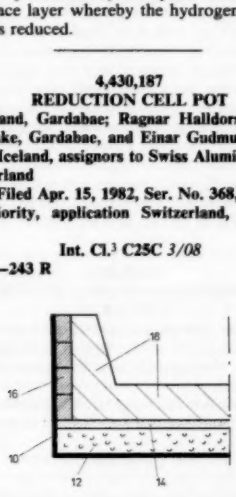
Sveinn Snaeland, Gardabae; Ragnar Halldorsson, Reykjavik; Alwis Franke, Gardabae, and Einar Gudmundsson, Kopavogur, all of Iceland, assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Apr. 15, 1982, Ser. No. 368,723

Claims priority, application Switzerland, Apr. 22, 1981, 2626/81

Int. Cl.³ C25C 3/08

U.S. Cl. 204—243 R 6 Claims



1. An electrolytic cell used in the production of aluminum comprising an outer steel sheel having a floor and side walls, a layer of insulation in the form of volcanic ash is provided on said floor of said outer steel shell, a carbon lining for containing the aluminum produced and an insulating leakage barrier provided between said volcanic ash layer of insulation and said carbon lining.

4,430,188

ELECTRODES FOR USE IN AN ELECTROLYTIC PROCESS

Johann G. E. Cohn, West Orange, N.J., assignor to Engelhard Corporation, Iselin, N.J.

Continuation of Ser. No. 188,166, Sep. 17, 1980, abandoned. This application Dec. 22, 1982, Ser. No. 452,358

Int. Cl.³ C25B 11/10

U.S. Cl. 204—290 F 2 Claims

1. An electrode for use in an electrolytic reaction, said electrode comprising a base having a surface of a valve metal, at least a portion of said surface having a thin, electronically conductive, electrocatalytic coating having a thickness effective for conducting electrolysis, said coating comprising a matrix and a modifier, and said matrix, exclusive of any binder or modifier, being essentially amorphous and essentially a chalcogen glass comprising germanium-tellurium.

4,430,189

METHOD OF MANUFACTURING ALUMINUM IN A HALL-HEROULT CELL

James M. Clark, Johnson City, and Duane R. Secrist, Elizabethton, both of Tenn., assignors to Great Lakes Carbon Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 241,536, Mar. 9, 1981, Pat. No. 4,379,033. This application Feb. 4, 1983, Ser. No. 463,967

Int. Cl.³ C25C 3/06, 3/12

U.S. Cl. 204—290 R 4 Claims

1. A method for manufacturing aluminum by the electrolysis of alumina in molten cryolite in a Hall-Heroult cell employing a non-consumable anode produced by the process of:

(a) forming a first conductive ceramic material to produce a core having a substantially flat working surface and non-working surface;

(b) forming a physically adherent coating over said non-working surface of said core, on at least the portion thereof which is to be exposed to the electrolyte bath in the cell, said coating consisting of a second conductive ceramic material having, as compared to said first conductive ceramic material,

(1) a coefficient of thermal expansion differing by no more than about 1.0×10^{-6}/°C.,

(2) an essentially matched shrinkage during sintering,

(3) a higher electrical resistivity, and capable of being chemical diffusion bonded thereto; and

(c) sintering the coated core thus formed to produce a monolithic ceramic anode having a substantially flat working surface and a non-working surface, said non-working surface having an impervious coating thereon, at least in the portion thereof exposed to the electrolyte bath, of higher resistivity than the core and chemical diffusion bonded thereto, whereby substantially all of the current applied to said anode is conducted into the electrolyte bath through said flat working surface.

4,430,190

DEVICE FOR CATHODE SPUTTERING OF AT LEAST TWO DIFFERENT MATERIALS

Carl-Ernst Eilers, Heidenheim, and Horst Pachonik, Taufkirchen, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Dec. 9, 1982, Ser. No. 448,220

Claims priority, application Fed. Rep. of Germany, Dec. 16, 1981, 3149910

Int. Cl.³ C23C *15/00*

U.S. Cl. 204—298 **4 Claims**

1. Device for cathode sputtering of at least two different materials comprising a holder, means for cooling said holder, a heat-conducting layer disposed on said holder, a target connected to said holder with said heat-conducting layer disposed therebetween, said target being exchangeably screwed to said holder said target being formed of one of the materials to be sputtered and having a plurality of blind holes formed therein, and pins formed of another material to be admixed in the sputtering being fitted in at least some of said blind holes.

4,430,191

SYSTEM FOR FEEDBACK CONTROL OF AIR/FUEL RATIO IN IC ENGINE WITH MEANS TO CONTROL CURRENT SUPPLY TO OXYGEN SENSOR

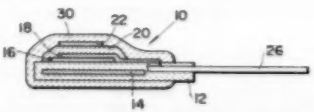
Kohki Sone, Tokyo, and Thuyoshi Kitahara, Yokohama, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jun. 17, 1982, Ser. No. 389,380

Claims priority, application Japan, Jun. 25, 1981, 56-98624

Int. Cl.³ G01N *27/46*

U.S. Cl. 204—401 **4 Claims**



1. A system for feedback control of the air/fuel ratio of an air-fuel mixture supplied to an internal combustion engine, comprising:

an oxygen sensor element which is disposed in an exhaust passage of the engine and has an electric heater and an oxygen concentration cell including an oxygen ion conductive solid electrolyte layer and reference and measurement electrode layers laid respectively on the solid electrolyte layer,

power supply means for applying a controlled voltage to said heater,

sensor control means for supplying a controlled DC current to said concentration cell such that the current flows in the solid electrolyte layer between the reference and measurement electrode layers to cause oxygen ions to migrate in the solid electrolyte layer toward the reference electrode layer to thereby maintain a reference oxygen partial pressure at the interface between the reference electrode layer and the solid electrolyte layer,

fuel feed control means for controlling the rate of fuel feed to the engine so as to correct deviations of actual air/fuel ratio from a predetermined first air/fuel ratio by utilizing an output voltage of the oxygen sensor element as a feedback signal representative of actual air/fuel ratio but maintaining a constant fuel feed rate corresponding to a predetermined second air/fuel ratio lower than said first air/fuel ratio if the output voltage of the oxygen sensor element continues to indicate that the actual air/fuel ratio remains on one side of said first air/fuel ratio,

detecting means for detecting breaking of the heater in the oxygen sensor element during operation of the system and producing an electrical signal indicative of the occurrence of breaking of the heater, and

interruption means for interrupting the supply of said DC current from said sensor control means to said concentration cell in the oxygen sensor element in response to said electrical signal produced by said detection means,

whereby, upon breakage of said heater, said output voltage of said oxygen sensor element remains above said first air/fuel ratio irrespective of the actual value of the air/fuel ratio.

4,430,192

OXYGEN GAS ANALYZER USING SOLID ELECTROLYTE

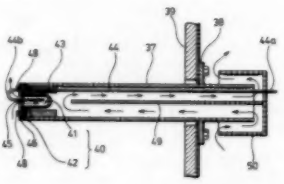
Masato Maeda, Tokyo, Japan, assignor to Yokogawa Hokushin Electric Corporation, Tokyo, Japan

Filed Mar. 2, 1982, Ser. No. 353,920

Claims priority, application Japan, May 26, 1981, 56-79865; Mar. 6, 1981, 56-31125[U]

Int. Cl.³ G01N *27/58*

U.S. Cl. 204—410 **6 Claims**



1. A solid electrolyte type oxygen meter having a probe type detecting section including a solid electrolyte unit fixed to the end thereof so as to form a partition wall and adapted to produce a signal corresponding to the difference in the oxygen concentration between the inner side and outer side of said partition wall;

said oxygen meter comprising a contact portion secured to the inner wall surface of said probe near the end of the latter through an electrically insulating member; a test tube type solid electrolyte unit inserted into and affixed to said end of said probe, a first electrode and a second electrode closely secured to the outer wall surface and the inner wall surface of the closed end wall of said solid electrolyte unit, or the portion of said solid electrolyte unit near said end wall, a first lead closely attached to said outer wall surface of said solid electrolyte unit and providing a connection between said first electrode and said contact portion, and a second lead closely attached to said inner wall surface of said solid electrolyte unit and providing an electrical connection between said second electrode and the open end surface of said solid electrolyte unit; and a first conductor and a second conductor connected to said contact portion and said open end of said solid electrolyte unit, respectively, thereby to transmit the signals produced by said first and second electrodes.

4,430,193

PROCESS FOR DISSOLVING COAL IN HYDROCARBON MIXTURES

Jürgen Stadelhofer, Dortmund, and Heinz-Gerhard Franck, Bad Soden-Neuenhain, both of Fed. Rep. of Germany, assignors to Rütgerswerke Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jul. 16, 1981, Ser. No. 283,869

Claims priority, application Fed. Rep. of Germany, Aug. 14, 1980, 3030723

Int. Cl.³ C10G *1/00*

U.S. Cl. 208—8 LE **3 Claims**

1. In a process for bringing ground coal or similar carbon-containing raw materials into solution with aromatic solvents under elevated pressure and at elevated temperature, the improvement wherein the solvents used are high-aromatic resi-

dues from the pyrolysis of petroleum fractions, having an average boiling point of above 380° C., and/or high-aromatic distillates from the pressure/heat treatment of coal tar pitch, having an average boiling point of above 380° C., as well as from 5 to 30% of aromatic products or mixtures of aromatic products, having a boiling point of below 250° C.; said process being carried out without hydrogenation, at temperatures of from 250° to 360° C.

4,430,194

METHOD FOR THE PRODUCTION OF A HIGHLY AROMATIC PITCH-LIKE COAL BY-PRODUCT

Jafar Omran, and Karl-Heinz Koch, both of Castrop-Rauxel, Fed. Rep. of Germany, assignors to Rutgerswerke Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Aug. 4, 1981, Ser. No. 289,936

Claims priority, application Fed. Rep. of Germany, Sep. 4, 1980, 3033228

Int. Cl.³ C10G *1/00, 73/00*

U.S. Cl. 208—8 LE **8 Claims**

1. In a method for the production of a highly aromatic pitch-like coal by-product by dissolving comminuted coal or similar solid carbon-containing raw materials with aromatic solvents at elevated temperature, the improvement which comprises dissolving these solid materials at atmospheric pressure using as solvent aromatic compound mixtures of coal origin with a mean boiling point above 350° C. selected from the group consisting of standard coal tar pitch, distillates with a mean boiling range of 350° to 500° C. obtained in the heat/-pressure treatment or carbonization of coal-tar pitch, and mixtures thereof, under reflux of the condensable fractions of the reaction gas.

4,430,195

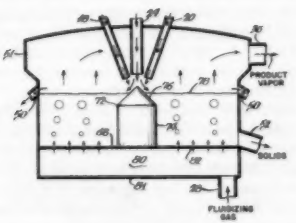
FLUID BED RETORTING PROCESS WITH LATERAL FLOW

Robert D. Oltrogge, Wheaton, Ill., assignor to Standard Oil Company, (Indiana), Chicago, Ill. and Gulf Oil Corporation

Filed Dec. 21, 1981, Ser. No. 333,040

Int. Cl.³ C10B *49/00, 53/00*; C10G *1/00*

U.S. Cl. 208—8 R **22 Claims**



20. A process for retorting solid hydrocarbon-containing material, comprising the steps of:

forming a single level laterally moving bed in an overflow fluid bed retort having only one level of perforated distributor plate means, said moving bed comprising solid hydrocarbon-containing material selected from the group consisting of oil shale, tar sands, coal, peat, lignite, uintaite and oil saturated diatomaceous earth and solid heat carrier material selected from the group consisting of spent hydrocarbon-containing material, sand, ceramic balls and metal balls;

said solid hydrocarbon containing material and said solid heat carrier material being mixed and deflected generally downwardly and laterally outwardly into said bed by a conical baffle extending upwardly from said perforated distributor plate means;

fluidly moving said bed above said perforated distributor plate means in a lateral direction for a sufficient time and at a sufficient temperature and at substantially only one level in said overflow retort to liberate hydrocarbons from said solid hydrocarbon-containing material in said bed;

spilling said bed over a generally upright barrier extending above said perforated distributor plate means into an overflow discharge outlet extending laterally outwardly of said retort for passage of the bed directly out of said retort; and

withdrawing said liberated hydrocarbons from said bed through a product outlet in said retort located above said bed.

4,430,196

METHOD AND COMPOSITION FOR NEUTRALIZING ACIDIC COMPONENTS IN PETROLEUM REFINING UNITS

Joseph H. Y. Niu, Houston, Tex., assignor to Betz Laboratories, Inc., Trevose, Pa.

Filed Mar. 28, 1983, Ser. No. 479,386

Int. Cl.³ C10G *7/10*

U.S. Cl. 208—47 **19 Claims**

1. A process for neutralizing acidic components of a distilling petroleum product in a refining unit comprising adding a neutralizing amount of a member selected from the group consisting of dimethylaminoethanol and dimethylisopropanolamine, and mixtures thereof, to said petroleum product.

4,430,197

HYDROGEN DONOR CRACKING WITH DONOR SOAKING OF PITCH

Paul C. Poynor, and Hugh E. Romine, both of Ponca City, Okla., assignors to Conoco Inc., Ponca City, Okla.

Filed Apr. 5, 1982, Ser. No. 365,721

Int. Cl.³ C10G *9/14, 57/00*

U.S. Cl. 208—56 **6 Claims**

1. In a hydrogen donor diluent cracking process in which a heavy hydrocarbonaceous material is thermally cracked in a cracking coil in the presence of hydrogen donor solvent, and in which spent donor is separated from cracked products, rehydrogenated and recycled to the cracking step, the improvement wherein at least part of the pitch fraction from the cracked products is heat soaked in a soaking tank separate from said cracking coil in the presence of hydrogenated donor solvent for a time and at a temperature sufficient to substantially reduce the amount of material in said pitch which is insoluble in pentane and said heat-soaked pitch is returned to said cracking coil.

4,430,198

HYDROTREATING HYDROCARBON FEEDSTOCKS

Roland H. Heck, Pennington; Edward J. Rosinski, Pedricktown, and Stuart S. Shih, Cherry Hill, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

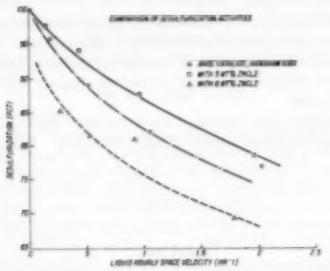
Division of Ser. No. 220,554, Dec. 29, 1980. This application Sep. 28, 1982, Ser. No. 425,846

Int. Cl.³ C10G *45/06*

U.S. Cl. 208—112 **35 Claims**

1. In a hydrotreating process comprising contacting a hydrocarbon feedstock with hydrogen in the presence of a catalyst comprised of at least one Group VIA metal, metal oxide or metal sulfide and at least one Group VIIIA metal, metal oxide or metal sulfide, deposited on an inorganic refractory oxide,

the improvement wherein said catalyst further comprises about 0.1% to about 7% by weight of a halogenated metal compound



selected from the group consisting of compounds of halogenated metals of Group IB, IIB, IIIB, titanium or tin.

4,430,199

PASSIVATION OF CONTAMINANT METALS ON CRACKING CATALYSTS BY PHOSPHORUS ADDITION

Vincent A. Durante, East Brunswick, N.J.; Dennis J. Olszanski, Erie, Pa.; William J. Reagan, Englishtown, and Stanley M. Brown, Scotch Plains, both of N.J., assignors to Engelhard Corporation, Edison, N.J.

Filed May 20, 1981, Ser. No. 265,516
Int. Cl.³ C10G *11/05*; B01J *37/28*
U.S. Cl. 208—114 **16 Claims**

1. In a process for cracking hydrocarbon feedstock contaminated with a metal poison comprising at least one of nickel, vanadium, iron and copper, by contacting the feedstock with a zeolite fluid cracking catalyst under cracking conditions, the improvement which comprises contacting said catalyst with an added phosphorus compound in amount sufficient to effect passivation of said metal poison, said added phosphorus compound being selected from the group consisting of tricresyl phosphate, an ammonium hydrogen phosphate, and mixtures thereof.

4,430,200

HYDROCARBON CONVERSION PROCESS

David S. Shihabi, Pennington, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 9, 1982, Ser. No. 406,416
Int. Cl.³ C10G *11/05, 97/20*
U.S. Cl. 208—120 **20 Claims**

1. A method for making a hydrocarbon conversion catalyst, which comprises steaming a large pore, crystalline aluminosilicate zeolite having a silica:alumina ratio of at least 12:1 and a Constraint Index of less than 1 until the zeolite has a reduced alpha value and base exchanging the steamed zeolite with an alkali metal to reduce the acidity to an alpha value of less than 5.

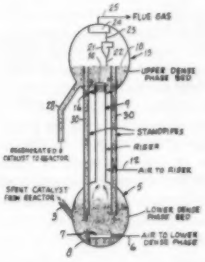
4,430,201

REGENERATION OF FLUIDIZABLE CATALYST

Leonce F. Castagnos, Jr., Nederland, and Roy E. Pratt, Neches, both of Tex., assignors to Texaco, Inc., White Plains, N.Y.

Filed Oct. 27, 1981, Ser. No. 315,470
Int. Cl.³ C10G *11/18*
U.S. Cl. 208—164 **2 Claims**

1. In a fluidized catalytic hydrocarbon conversion process wherein spent catalyst from said hydrocarbon conversion reaction is stripped of volatile hydrocarbons prior to regeneration and stripped catalyst is regenerated by burning coke therefrom with an oxygen-containing gas, the improvement which comprises passing stripped catalyst to a first catalyst regeneration zone of a catalyst regeneration system comprising multiple regeneration zones, maintaining a dense phase fluidized bed of catalyst in said first regeneration zone by the introduction of primary regeneration air into the lower portion of said zone at a rate sufficient to cause fluidization of said catalyst particles and partial regeneration of said catalyst with the production of gaseous reaction products comprising carbon monoxide, passing partially regenerated catalyst particles entrained in said gaseous reaction products from said first dense phase fluidized bed regeneration zone into a superposed disperse phase entrained catalyst riser regeneration zone, supplying secondary regeneration air to said riser regeneration zone in an amount sufficient to provide an excess of oxygen over that required for complete combustion of carbon monoxide and residual coke from said catalyst to carbon dioxide, discharging catalyst and flue gases resulting from the burning of coke from spent catalyst from the riser regeneration zone into the lower portion of a superposed second dense phase fluidized bed regeneration



zone, maintaining a dense phase fluidized bed of catalyst in said second regeneration zone with fluidization solely by flue gases from said riser regeneration zone, separating flue gases from regenerated catalyst in said second regeneration zone, discharging resulting flue gases containing 1 to 3 mole percent oxygen and less than 500 ppm carbon monoxide from second regeneration zone, withdrawing regenerated catalyst containing 0.01 to 0.1 weight percent carbon and at a temperature in a range of 1250° to 1450° F. from said second dense phase regeneration zone as regenerated catalyst for said reaction zone, and recirculating a further separate portion of said regenerated catalyst from said second dense phase fluidized bed catalyst regeneration zone to said first dense phase fluidized bed catalyst regeneration zone wherein the rate or recirculation of regenerated catalyst from said second dense phase bed to said first dense phase bed regeneration zone is governed solely by the relative rates of introduction of primary and secondary regeneration air to said first regeneration zone and to said riser regeneration zone.

4,430,202

DISTILLATE OIL MOISTURE DEHAZING PROCESS

J. J. Bloess, 313 Shenandoah Rd. East, Mobile, Ala. 36608

Filed Mar. 5, 1982, Ser. No. 355,145
Int. Cl.³ C10G *33/00*
U.S. Cl. 208—187 **8 Claims**

1. A method of reducing the water content in liquid hydrocarbon distillate fuel oil that has been subjected to a steam treatment, and subsequently cooled prior to being sent to storage to about 120°–180° F., comprising the steps of:

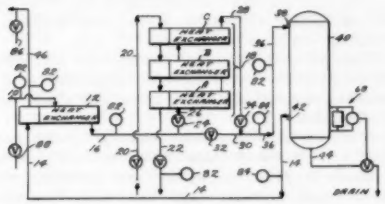
(A) gradually cooling the fuel oil by

(a) passing the oil to a first indirect cooling means to reduce the temperature of the oil by approximately 20° F.;

(b) passing the oil to a second indirect cooling means to further reduce the temperature of the oil;

(B) passing the oil from the second cooling means to and

through separation means where at least a substantial portion of the water is separated from the oil;



(C) heating the oil collected from said separation means prior to storage.

4,430,203

HYDROTREATING OR HYDROCRACKING PROCESS

Dennis R. Cash, Novato, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Feb. 5, 1982, Ser. No. 346,209
Int. Cl.³ C10G *65/04*
U.S. Cl. 208—210 **7 Claims**

1. A process for hydroprocessing comprising:

(a) passing a two-phase reaction mixture of a hydrogen rich gas and a liquid hydrocarbon containing at least one of either a nitrogen impurity or a sulfur impurity through a single vessel hydroprocessing reaction zone containing a series of fixed spaced hydroprocessing catalyst beds, at least two adjacent beds being separated by a first perforated tray, a second perforated tray and a third perforated tray, said first perforated tray and said second perforated tray defining a vapor withdrawal space and said second perforated tray and said third perforated tray defining a hydrogen introduction space;

(b) withdrawing vapors containing at least one of either ammonia or hydrogen sulfide from said vapor withdrawal space;

(c) introducing hydrogen into the hydrogen introduction space wherein the amount of hydrogen is substantially equal to the amount of withdrawn vapors; and

(d) passing the liquid hydrocarbon directly to the next bed.

4,430,204

REMOVAL OF SURFACTANTS FROM HYDROCARBONS WITH ALCOHOL

Robert P. Aiello, Cypress; George Stefanidakis, and Dwayne E. Poling, both of Houston, all of Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Jun. 24, 1982, Ser. No. 391,630
Int. Cl.³ C10G *29/22*
U.S. Cl. 208—240 **6 Claims**

1. A method for removing hydrocarbon-soluble anionic surfactants from gasoline or kerosene boiling range hydrocarbons which comprises:

(a) treating a hydrocarbon-surfactant mixture with an effective amount of methanol or ethanol for a time sufficient to permit a desired proportion of said surfactants in the hydrocarbon-surfactant mixture to associate intimately with the alcohol;

(b) contacting the hydrocarbon-surfactant-alcohol mixture with an effective amount of either water or caustic solution, or caustic solution followed by water, for a time sufficient to extract a major portion of said methanol or ethanol and surfactants from said hydrocarbons;

(c) separating the water or caustic solution containing said methanol or ethanol and surfactants from said hydrocarbons; and

(d) recovering said hydrocarbons.

4,430,205

METHOD FOR THE IMPROVEMENT OF THE OXIDATION RESISTANCE OF HYDROCARBON OIL, ESPECIALLY TRANSFORMER OILS BY THE SELECTIVE REMOVAL OF PRO-OXIDANT NITROGEN AND SULFUR COMPOUNDS THEREFROM

Gerald Felsky, Sarnia, Canada, assignor to Exxon Research and Engineering Company, Florham Park, N.J.

Filed Jun. 13, 1983, Ser. No. 503,673
Int. Cl.³ C10G *29/08*
U.S. Cl. 208—246 **15 Claims**

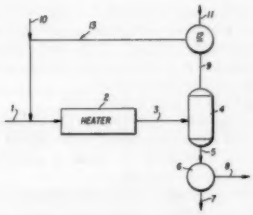
1. A method for improving the oxidation resistance of hydrocarbon oils comprising contacting a hydrocarbon oil stream containing nitrogen and sulfur containing compounds with a silver salt impregnated adsorbent whereby the nitrogen and sulfur containing compounds are taken up by the silver salt impregnated adsorbent, and thereby removed from the hydrocarbon oil, contacting an aromatic solvent with the silver salt impregnated adsorbent to remove the aromatic sulfur compounds from said silver salt impregnated adsorbent and combining said aromatic sulfur compounds with either the extracted hydrocarbon oil stream or a different hydrocarbon oil stream thereby improving the oxidation resistance of said hydrocarbon oil.

4,430,206

DEMETALATION OF HYDROCARBONACEOUS FEEDS WITH H_2S

Lillian A. Rankel, Princeton, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 220,557, Dec. 29, 1980, abandoned. This application Dec. 9, 1982, Ser. No. 448,132
Int. Cl.³ C10G *7/00, 45/00*
U.S. Cl. 208—251 R **28 Claims**



1. A noncatalytic process for removing at least one metal contaminent from shale oil comprising contacting the shale oil with a gas comprised of about 40% to about 100% by volume of hydrogen sulfide and about 0% to about 60% by volume of hydrogen at a pressure of at least 15 psig and at a temperature of about 600° F. to about 800° F.

4,430,207

DEMETALLIZATION OF HYDROCARBON CONTAINING FEED STREAMS

Simon G. Kukes, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

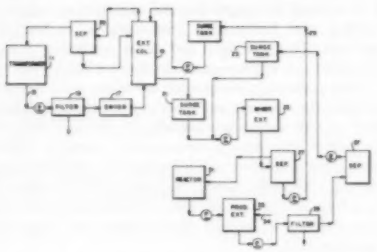
Filed May 17, 1983, Ser. No. 495,384
Int. Cl.³ C10G *45/08;* B01J *27/14*
U.S. Cl. 208—251 H **15 Claims**

1. A process for the demetallization of a hydrocarbon containing feed stream, which contains metals, comprising the step of contacting said hydrocarbon containing feed stream under suitable demetallization conditions with hydrogen and a catalyst composition comprising zirconium phosphate and chromium phosphate.

4,430,208
METHOD FOR THE SOLVENT EXTRACTION OF POLYCHLORINATED BIPHENYLS

Louis J. Pytlewski, and Edward J. Thorne, both of Philadelphia, Pa., assignors to The Franklin Institute, Philadelphia, Pa.

PCT No. PCT/US82/00749, § 371 Date Oct. 29, 1982, § 102(e) Date Oct. 29, 1982
PCT Filed Jun. 2, 1982, Ser. No. 440,232
Int. Cl.³ C10G 17/00
U.S. Cl. 208—262 **33 Claims**



1. A process for the removal of polychlorinated biphenyls from a fluid containing the same which comprises:

contacting said fluid with polyethylene glycol for a period of time sufficient for said glycol to selectively extract at least a portion of the chlorinated biphenyl compounds from said fluid; and

separating the polyethylene glycol and extracted polychlorinated biphenyls from said fluid.

18. A process for removing and detoxifying a polychlorinated biphenyl present in the dielectric fluid of an electrical transformer which comprises:

drawing off dielectric fluid from said transformer;

contacting said drawn off fluid with polyethylene glycol in a primary extraction operation for a period of time sufficient for said glycol to selectively extract at least a portion of the chlorinated biphenyl from said fluid; separating from said fluid the polyethylene glycol containing extracted polychlorinated biphenyl;

returning said fluid to said transformer;

solvent extracting with cyclohexane the chlorinated biphenyl compound from the polyethylene glycol in a secondary extraction operation to form a cyclohexane-polychlorinated biphenyl extract;

separating said cyclohexane-polychlorinated biphenyl extract from said polyethylene glycol and recycling the latter to said primary extraction operation;

removing cyclohexane from said cyclohexane-polychlorinated biphenyl extract and dehalogenating the remaining polychlorinated biphenyl; and

recycling said cyclohexane to said secondary extraction operation.

4,430,209
METHOD AND APPARATUS FOR ELUTRIATION OF SHOT FROM MINERAL FIBER

James Q. Merck, Largo, and Leon F. Barry, St. Petersburg, both of Fla., assignors to The Celotex Corporation, Tampa, Fla.

Filed Feb. 16, 1982, Ser. No. 349,407
Int. Cl.³ B03B 7/00
U.S. Cl. 209—3 **27 Claims**

1. An apparatus for de-shotting shot-containing mineral wool comprising:

(a) a battery of washing vessels located in sequence, each of said washing vessels having (i) baffle means positioned therewithin for blocking the upper section of said washing vessel to the passage thereacross of a flowing liquid while leaving the lower section of said washing vessel open to the passage thereacross of said liquid so that said upper section of each washing vessel is divided into a receiving compartment for receiving a flowing liquid and a discharge compartment into which said liquid flows after passing underneath said baffle means, and (ii) discharge means positioned at the lowest point of said lower section for discharging non-fibrous material which settles in said washing vessel,

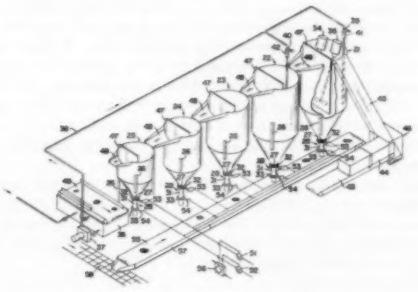
(b) liquid delivery means for continuously introducing a flowing liquid into the receiving compartment of the first washing vessel of said battery to one side of said vessel's baffle means,

(c) means for delivering shot-containing mineral wool to said receiving compartment of the first washing vessel,

(d) means for gently mixing said shot-containing mineral wool in said receiving compartment of the first washing vessel to convert said shot-containing mineral wool into a dispersion of fibrous and non-fibrous materials in said flowing liquid,

(e) a device located in sequence after the last washing vessel of said battery for separating said flowing liquid from the de-shotted fibrous material, and

(f) flow connection means positioned and arranged with respect to said discharge compartment of each of the washing vessels for conveying said flowing liquid and associated dispersed materials to the receiving compartment of the next washing vessel of the sequence or, in the case of said last washing vessel of the battery, to said device for separating said flowing liquid from said de-shotted fibrous material, whereby flowing liquid introduced into said receiving compartment of the upper section of each of said washing vessels to one side of said vessel's baffle means flows downwardly and then under said baffle means and upwardly to said vessel's discharge compartment to the other side of said baffle means, a separation being thereby effected between the fibrous material which is conveyed along by said flowing liquid and the non-fibrous material which settles at the bottom of said vessel, said non-fibrous material being discharged from said vessel by said discharge means.



14. A method of de-shotting shot-continuing mineral wool comprising the steps of:

(a) continuously flowing a liquid through a battery of washing vessels located in sequence, each of said washing vessels having baffle means positioned therewithin for blocking the upper section of said washing vessel to the passage thereacross of said flowing liquid while leaving the lower section of said washing vessel open to the passage thereacross of said liquid so that said upper section of each washing vessel is divided into a receiving compartment for receiving said flowing liquid and a discharge compartment into which said liquid flows after passing underneath said baffle means, said flowing liquid being introduced into said receiving compartment of each washing vessel,

(b) delivering shot-containing mineral wool to the receiving compartment of the first washing vessel of said battery,

(c) gently mixing said shot-containing mineral wool in said receiving compartment of the first washing vessel to convert said shot-containing mineral wool into a dispersion of fibrous and non-fibrous materials in said flowing liquid, whereby said flowing liquid and associated dispersed materials introduced into the receiving compartment of each of said washing vessels to one side of said vessel's baffle means flow downwardly and then under said baffle means and upwardly to said vessel's discharge compartment to the other side of said baffle means, a separation being thereby effected between the fibrous material which is conveyed along by said flowing liquid and the non-fibrous material which settles at the bottom of said vessel,

(d) discharging said settled non-fibrous material from said washing vessels, and

(e) separating, after passage of said flowing liquid and associated de-shotted fibrous material through said battery of washing vessels, said flowing liquid from said de-shotted fibrous material,

wherein each of said washing vessels has flow connection means asociated with said discharge compartment of said vessel for conveying said flowing liquid and associated dispersed materials to the next separation step of the sequence.

4,430,210

SCREEN

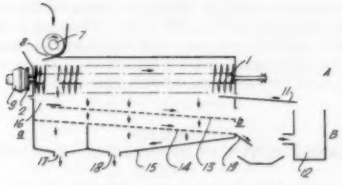
Rolf Tuuha, Pori, Finland, assignor to Rauma-Repola Oy, Finland

Continuation-in-part of Ser. No. 165,863, Jul. 7, 1980, abandoned. This application Mar. 12, 1981, Ser. No. 243,073

Claims priority, application Finland, Jul. 13, 1979, 792212; Apr. 2, 1980, 801045; Apr. 2, 1980, 801046; Feb. 19, 1981, 810514

Int. Cl.³ B07B 1/15

U.S. Cl. 209—23.4 **7 Claims**



1. A screen for the separation of an oversize fraction from pulp chips on the basis of the thickness of the chips, comprising a screen face having at least two synchronously driven screw spirals, each of said screw spirals includes a core part having a mantle face and a spiral wing secured around the core part, said spiral wings are arranged to interlock in between each other, an outer circumference of each wing extends to the proximity of the mantle face of the core part of the adjoining spiral, adjoining spirals are opposite-handed and have opposite directions of rotation, and the distance between the interlocking portions of the wings being less than the distance between mantle faces of adjoining spirals and corresponding to the maximum acceptable thickness of the chips.

4,430,211

VIBRATING SCREEN

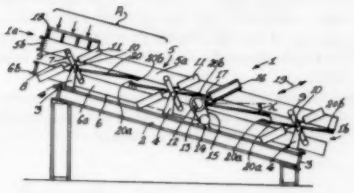
Otto H. J. Martin, Hattingspruit, South Africa, assignor to Damar Manufacturing Company, Hattingspruit, South Africa

Filed Dec. 21, 1981, Ser. No. 332,376

Claims priority, application South Africa, Oct. 13, 1980, 80/6290

Int. Cl.³ B07D 1/38

U.S. Cl. 209—314 **4 Claims**



1. A screening arrangement defining a feed end and a discharge end, comprising:

two frame-like movable masses being vertically spaced-apart and interconnected by linkage members, said two masses being movable in substantially opposite directions relative to each other,

an exciter connected to said arrangement to impart substantially reciprocable movement to said masses to move said masses in substantially opposite directions relative to each other,

a screen made of substantially non-stretchable, flexible material connected at one end thereof to one of said two masses and connected at its opposite end thereof to the other one of said two masses,

said screen being movable by said two masses between a first position wherein said screen is taut and a second postion wherein said screen is slack,

said two masses being arranged to slant said screen downwardly from said feed end to said discharge end,

said screen being secured at its end facing said feed end to the bottom one of said two masses and at its end facing said discharge end to the top one of said two masses.

4,430,212

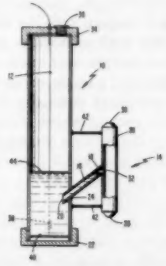
VOLUMETRIC FILTER FOR LIQUID LEVEL MEASUREMENT DEVICES

Manuel Gutierrez, 1273 Meadow Sweet Rd., Golden, Colo. 80401, and Michael A. Gutierrez, 636 S. Addison, Lexington, Ky. 40504

Filed Aug. 25, 1982, Ser. No. 411,146

Int. Cl.³ B03D 3/00

U.S. Cl. 210—104 **3 Claims**



1. A filter for a liquid level measurement apparatus having

an electrical level sensing probe within a sensing tube receiving liquid from a container, comprising:

a connecting tube forming a passageway for liquids between said container and said sensing tube, said connecting tube having a first opening within the liquid container and a second opening within the sensing tube,

said first opening disposed within said container for intaking and outletting liquids at a first level, and

said second opening disposed within said tube for outletting and intaking liquids at a second level below said first level, said connecting tube having a volume selected to prevent passage of buoyant liquids floating in a layer of a particular height above the liquid in said container to said sensing tube,

said volume selected to be no less than the volume displaced in said sensing tube by a layer of said buoyant liquid of said particular height in said container.

4,430,213

ULTRAFILTRATION UNIT

Soji Ishikawa, No. 6-22, Miyazaki 6-chome, Takatsu-ku, Kawasaki-shi, Kanagawa-ken, Japan

Filed Feb. 9, 1982, Ser. No. 347,161

Claims priority, application Japan, Jul. 8, 1981, 56-101327

Int. Cl.³ B01D *31/00*

U.S. Cl. 210—136 **1 Claim**

1. An ultrafiltration unit for use with a syringe having a tapered snout, consisting of:

a housing having a dome-shaped upper part provided with a flange at its peripheral edge and a funnel-shaped lower part provided with a flange at its peripheral edge which are airtighty connected and sealed together along the peripheral flanges, said upper part having a single inlet pipe at its top and a chamber therein for forcing a sample liquid and air in the chamber, a bore of the inlet pipe being partially flared from the intermediate toward its free end for allowing to engage with the snout of the syringe and being provided with a shoulder portion adjacent below the flared bore section, said lower part having an internal slanted surface and a single outlet pipe at its apex,

a disc-shaped ultrafilter internally disposed in the housing held between the peripheral flanges of the upper and lower parts of the housing and supported on a plurality of radial support ribs integrally formed on the slanted surface of the lower part of the housing, and

a check valve provided in the inlet pipe, said check valve being partially fixed to the shoulder portion in the inlet pipe so as to be bendable downwardly toward the chamber or thrustable against the shoulder portion, whereby a sample liquid and air can be forced into the chamber of the upper part of the housing while escape of the air is blocked.

4,430,214

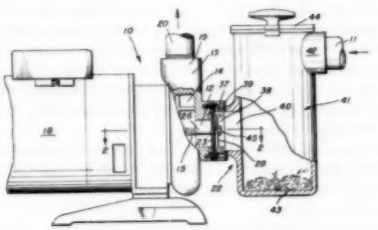
STRAINER MILL FOR SWIMMING POOL PUMP INTAKE

Marvin E. Baker, 815 Ewing Ave., Nashville, Tenn. 37203

Filed Sep. 15, 1982, Ser. No. 418,233

Int. Cl.³ E04H *3/20*

U.S. Cl. 210—169 **3 Claims**



1. In a swimming pool water circulation system including a centrifugal pump having a rotary impeller shaft supporting an impeller, an intake opening coaxial with the impeller shaft and a discharge outlet, a strainer mill comprising:

(a) a planar strainer plate having a plurality of flow holes therethrough for the passage of water and spanning the intake opening of the centrifugal pump, said strainer plate having an intake face on the opposite side of said strainer plate from the pump impeller,

(b) a cutter shaft member extending coaxially from the impeller shaft through said strainer plate, for rotary movement with said impeller shaft and relative to said strainer plate,

(c) a cutter blade fixed to and extending radially from said cutter shaft member and spaced closely adjacent and spanning said intake face of said strainer plate, said cutter blade having a sharp leading edge and terminating in a radially outer extremity,

(d) a mill chamber having an imperforate cylindrical wall concentric with said cutter shaft member and mounted adjacent said intake face and in fluid communication with said strainer plate,

(e) said mill chamber receiving said cutter blade, the radius of said mill chamber being slightly greater than the distance from the axis of said cutter shaft member to said outer extremity,

(f) a collector receptacle having an inlet in fluid communication with an intake conduit from a swimming pool, and an outlet in fluid communication with said mill chamber,

(g) said receptacle having a bottom wall below said mill chamber for collecting debris by gravitation.

4,430,215

ARRANGEMENT FOR BIOLOGICAL CLEANING OF WATER

Svatopluk Mackrle, Brno; Vladimir Mackrle, Prague, and Oldrich Dracka, Brno, all of Czechoslovakia, assignors to Agrotechnika, narodny podnik podnikove riaditelstvo, Zvolen, Czechoslovakia

Filed Mar. 26, 1982, Ser. No. 362,302

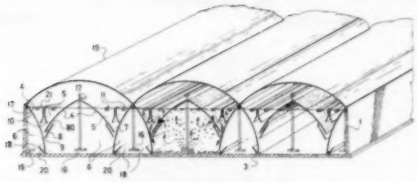
Claims priority, application Czechoslovakia, Apr. 2, 1981, 2484-81

Int. Cl.³ C02F *1/72, 3/20, 3/22*

U.S. Cl. 210—195.4 **14 Claims**

1. Arrangement for the biological cleaning of water, comprising an activating system having pneumatic aeration and supply of raw water and a separating system on the principle of fluid filtration with automatic return of activated sludge into the activating system, said pneumatic aeration and supply of raw water and said separating system being contained in a single vessel having a self-supporting side walls and a bottom,

said activating system communicating with the separating system, the separating system having a number of part activating spaces, and the system of activating spaces having a number of separating spaces, both the system of separating spaces and the system of activating spaces being formed by a system of couples of inserted parallel arranged longitudinal partition walls converging in a downward direction, at least one lower edge of one partition wall of a couple forming with the oppo-



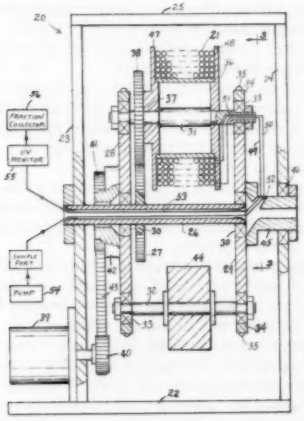
site part of the adjacent partitition wall of such couple, a passage for mutual communication between part activating spaces and part separating spaces, a channel provided adjacent to said passage, said channel being formed both by an inserted wall extending vertically beyond the level of the passage in both directions and by an opposite part of the longitudinal partition wall, the part activating spaces being mutually connected at their ends by transitory passages.

4,430,216

HIGH SPEED PREPARATIVE COUNTERCURRENT CHROMATOGRAPHY WITH A MULTIPLE LAYER COILED COLUMN

Yoichiro Ito, Bethesda, Md., assignor to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Filed Sep. 9, 1982, Ser. No. 416,107
Int. Cl.³ B01N *15/08*
U.S. Cl. 210—198.2 **13 Claims**



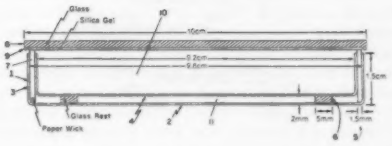
1. An apparatus for continuous countercurrent chromatography comprising a support, helical separation column means including means to retain a large volume of stationary phase comprising a multi-layer helically coiled column rotatably mounted on the support on a first axis, inlet and outlet flow tubes connected to the terminal ends of said multi-layer coiled column, and means to simultaneously rotate said multi-layer coiled column around said first axis and revolve it around a second axis spaced from and being parallel to said first axis, whereby to simultaneously develop both force reversals and centrifugal forces in said multi-layer coiled column.

4,430,217

ANTI-RADIAL CHROMATOGRAPHY DEVICE

Haleem J. Issaq, Frederick, Md., assignor to Litton Bionetics, Inc., Kensington, Md.

Filed May 18, 1981, Ser. No. 264,751
Int. Cl.³ B01D *15/08*
U.S. Cl. 210—198.3 **1 Claim**



1. An anti-radial chromatographic device comprising a shallow outer dish having an essentially flat bottom and a vertical cylindrical side well, opening upwardly an inner dish in form essentially congruent with the outer dish and nesting concentrically within the outer dish providing a uniform clearance of 0.2 mm to 3.0 mm between the inner and outer vertical side walls, spacing means separating the bottoms of the inner and outer dishes and forming an outer solvent chamber therebetween, capillary transport means between the inner and outer side walls and extending slightly beyond the tops of said walls for transferring fluid upwardly from the outer dish solvent chamber, the outer dish resting upon a platform having leveling and centering means for leveling and centering the outer dish, and a chromatography plate covering the inner and outer plates and contacting the capillary transport means, thereby forming an inner solvent chamber bounded by the inner dish and the chromatographic plate.

4,430,218

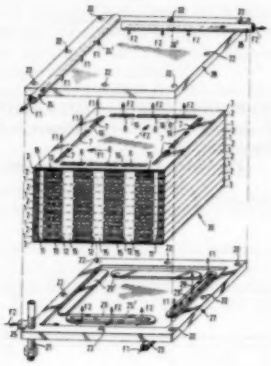
SEPARATING DEVICE FOR FLUIDS, CONSISTING OF SUPPORT PLATES AND CUT SECTIONS OF A SEMI-PERMEABLE DIAPHRAGM

Horst Perl; Dietmar Nussbaumer, both of Gottingen; Hans-Weddo Schmidt, Hardegsen; Gunter Pradel, and Ulrich Grummert, both of Gottingen, all of Fed. Rep. of Germany, assignors to Sartorius GmbH, Fed. Rep. of Germany

Filed Jul. 10, 1981, Ser. No. 281,931
Claims priority, application Fed. Rep. of Germany, Jul. 18, 1980, 3027413
Int. Cl.³ B01D *31/00*
U.S. Cl. 210—321.3 **7 Claims**

1. A separating device comprising support plates and cut diaphragm sections of a semi-permeable material, for a first and second fluid flowing on opposite sides of said diaphragm sections in separate flow paths, wherein said support plates are sealed from the outside of said device and additionally sealed to assure the separate flow of the first and second fluid by a sealing means, the support plates are provided with cutoff channel grooves, said cutoff channel grooves of adjacent facing support plates form conduits into which sealling material in a flowable state is injected, the sealing material is injected into said conduits through perforations in said support plates, said

perforations communicate with said conduits and other perforations in other adjacent facing support plates, and the sealing



material is allowed to solidify in said perforations and said conduits thus forming said sealing means.

4,430,219

HOLLOW FIBER PACKAGE BODY AND ITS PRODUCTION

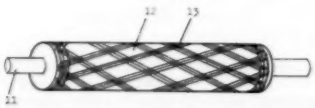
Hideshi Kuzumoto; Tutomu Tanaka, and Hiroshi Matsumoto, all of Otsu, Japan, assignors to Tayo Boseki Kabushiki Kaisha, Japan

Continuation of Ser. No. 170,218, Jul. 18, 1980, abandoned, which is a continuation of Ser. No. 1,043, Jan. 4, 1979, abandoned. This application Jun. 24, 1982, Ser. No. 391,771

Claims priority, application Japan, Jan. 10, 1978, 53-1775

Int. Cl.³ B01D *39/00*; D02G *3/00*

U.S. Cl. 210—321.3 **8 Claims**



1. A hollow fiber package body for separation of fluid comprising a core and layers of hollow fibers having a selective permeability arranged around said core, said hollow fiber, layers being formed by tape-like bundles of hollow fibers said bundles composed of an arrangement of hollow fibers in nearly parallel relations to one another and in a flat state, said bundles having been turned back near the end of said package body while being held by at least one string or band, the width of each hollow fiber bundle being from 15 to 50,000 d (where d is the outer diameter of a hollow fiber) and the ratio of the thickness to the width of each hollow fiber bundle being from 1/20,000 to 1/5, said hollow fiber bundles being arranged in multi-layers by intersecting at least at one spot between one end and the other end of said package body, and said hollow fiber bundles being arranged in mutually and up- and downwardly intersecting relationships crossing two or more adjacent layers.

8. A membrane separation device comprising a tubular container having an entrance for fluid and a hollow fiber package body according to claim **1** accommodated in said container.

4,430,220

APPARATUS FOR CONTROLLING FLUID MEDIUM FLOW

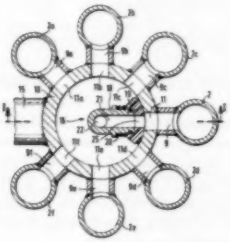
Wolfgang Litzenburger, Hassloch, Fed. Rep. of Germany, assignor to Flutec Fluidtechnische Geräte GmbH, Fed. Rep. of Germany

Filed Jul. 29, 1982, Ser. No. 403,138

Claims priority, application Fed. Rep. of Germany, Aug. 7, 1981, 3131281

Int. Cl.³ B01D *29/38*

U.S. Cl. 210—333.1 **4 Claims**



1. An apparatus for controlling the flow of at least one fluid through a flowthrough element such as a filter comprising

a first hollow housing having a circularly cylindrical interior, an inlet opening for delivering fluid thereto and a plurality of outlet openings lying in substantially the same plane perpendicular to the axis of said cylindrical interior, said inlet opening being axially offset from said plane; means for supplying fluid under pressure to said inlet opening of said first housing;

a plurality of second hollow housings, each capable of receiving a flowthrough element,

each of said second housings having a conduit connected to receive fluid from one of said outlet openings of said first housing, and having an outlet opening;

a rotary valve in said first housing having

a discharge opening,

an axially extending member at least a portion of which is hollow and communicates with said discharge opening, said axially extending member being rotatably mounted in said first housing,

a radially extending tubular member communicating with said hollow portion of said axially extending member, the axis of said radially extending member lying in the plane containing said outlet openings, and

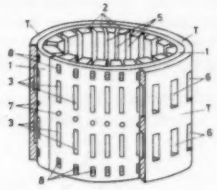
a valve element selectively connectable to any one of said plurality of outlet openings, said valve element comprising a mouthpiece on said radially extending member for coupling to a selected outlet opening and spring means urging said mouthpiece toward the interior wall of said first housing; and

means for receiving fluid under pressure from said second housing; whereby when said rotary valve is connected to a selected one of said plurality of outlet openings a fluid flow path is established from said means for receiving to said discharge opening, causing flow in the reverse direction through the one of said second housings connected to said selected outlet opening, said reverse direction flow operating to flush contaminates from said filter.

4,430,221
CENTRIFUGE SIEVE

Leonhard Spiewok, Wallisellen, Switzerland, assignor to Escher Wyss Limited, Zurich, Switzerland

Filed Jul. 6, 1982, Ser. No. 395,142
Claims priority, application Switzerland, Jul. 24, 1981, 4826/81
Int. Cl.³ B04B 3/00, 7/16
U.S. Cl. 210—380.1 13 Claims

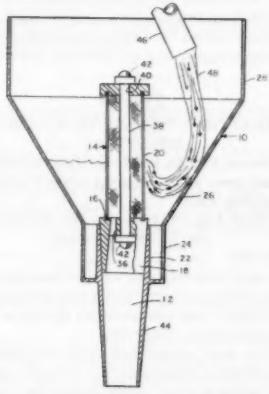


1. A centrifuge sieve comprising:
a centrifuge drum having an inner surface;
a support arrangement bearing at the inner surface of said centrifuge drum;
sieve rods secured at the support arrangement at least at two locations and extending in axial direction of the centrifuge drum;
said sieve rods being formed of a wear-resistant hard material;
connection means for fixedly connecting the sieve rods at one location with the support arrangement; and
connection means provided at the other of said two locations between the sieve rods and the support arrangement in order to enable a mobility of the sieve rods in relation to the support arrangement only in the axial direction.

4,430,222
WATER SHEDDING DEVICE

Richard E. Walker, 237 Charleston St., Cadiz, Ohio 43907

Filed Sep. 27, 1982, Ser. No. 424,845
Int. Cl.³ B01D 23/28
U.S. Cl. 210—477 18 Claims



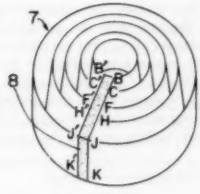
1. In a container having container side walls and a drain opening therethrough from which fluid flows by gravity: a generally tubular boss sealed to said walls around said drain opening and projecting generally vertically into said container; a pervious enclosure in said container rising vertically and sealed to said boss, said pervious enclosure having openings therethrough which communicate the inside of said container to the inside of said enclosure, said openings being no larger than about 100 mesh and being surrounded by a hydrophobic material which opposes water from entering said enclosure from said container, said walls of said container being shaped to provide a sump surrounding said boss, and being further constructed and arranged so that flow along said container walls proceeds toward said sump and then passes over said sump and reverses direction toward said pervious enclosure before proceeding downwardly and out of said drain opening, and means for visually detecting water between said boss and side walls of said container.

17. A water shedding assembly comprising: a tube having three distinct sections including a lower end impervious section with sealing means for effecting a seal with its external periphery, a middle impervious section projecting upwardly from said lower end sealing means for keeping a level of liquid external and above said sealing means, and an upper pervious section through which fluid must enter the inside of said tube, said pervious section having openings of no greater than about 100 mesh and being of a hydrophobic material: and said lower end impervious section being of a hydrophobic material to keep water from getting past said means for effecting a seal with its periphery.

4,430,223
FILTER ELEMENT FOR FILTERING FLUID AND METHOD OF PRODUCING SAME

Susumu Miyakawa, Kariya; Toshiaki Fukuta; Hajime Akado, both of Anjo, and Yoshihiro Taki, Nagoya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Feb. 19, 1982, Ser. No. 350,146
Claims priority, application Japan, Feb. 25, 1981, 56-27242; Mar. 6, 1981, 56-32861; Mar. 6, 1981, 56-32862; Jul. 10, 1981, 56-108705; Oct. 28, 1981, 56-172428; Dec. 11, 1981, 56-200678
Int. Cl.³ B01D 27/06, 46/52
U.S. Cl. 210—493.5 7 Claims

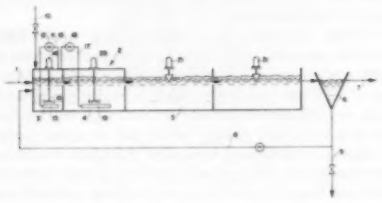


1. A cylindrical filter element for filtering fluid, having two-dimensional wave forms spreading radially from the axis of said cylindrical element and including a plurality of closed wave crest lines, and being produced through the steps of preparing a filter material strip shaped symmetrical with respect to a center line extending from narrower one end to the wider other end of the strip, of folding said filter strip along a plurality of folding lines substantially perpendicular to the center line to form parallel wave forms between the two ends, and of curving and closing the folded filter strip in such a manner that said narrower end is located on the inner peripheral side of the curved filter strip and said wider end on the outer peripheral side, characterized in that at least one interval between adjacent two of said folding lines is different from at least one of the other intervals, and thus, at least one crest line or bottom line of said two-dimensional wave form is different from at least one of the other crest lines or bottom lines with respect to their heights.

4,430,224
PROCESS AND APPARATUS FOR BIOLOGICALLY TREATING WASTE WATERS

Uwe Fuchs, Munich, Fed. Rep. of Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Filed Dec. 1, 1981, Ser. No. 326,308
Claims priority, application Fed. Rep. of Germany, Dec. 1, 1980, 3045158
Int. Cl.³ C02F *3/26*
U.S. Cl. 210—604 **9 Claims**



1. In a process for biologically treating wastewater by the activated sludge process, wherein the wastewater is aerated in an activation basin comprising a plurality of sections, and wherein the mixture of wastewater and activated sludge is removed from the activation basin, and separated in a settling stage into purified water and sludge with at least a part of the separated sludge being recycled into the activation basin, the improvement comprising:

treating the wastewater in an activation basin having at least four separate sections, comprising the steps of passing the wastewater into a first of said sections and aerating the wastewater in the first section with a gas feed having a higher O_2 concentration than air, passing resultant aerated wastewater from the first section into a second section having a volume exceeding the volume of the first section by an amount equal to about the volume of the first section and further aerating the wastewater therin with a gas feed having a higher O_2 concentration than air, passing resultant further aerated wastewater from the second section into a third section having a volume exceeding the volume of the second section by an amount equal to about the volume of the first section and also still further aerating the wastewater therein, with the aerating feed being air, and passing resultant still further aerated wastewater from the third section into a fourth section having a volume exceeding the volume of the third section by an amount equal to about the volume of the first section and also still further aerating the wastewater therein, with the aerating feed also being air, before passing the latter to the settling stage.

4,430,225
AERATION TANK FOR ACTIVATED-SLUDGE PROCESS SEWAGE TREATMENT

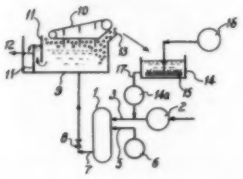
Akira Takamatsu, and Hiroshi Higuchi, both of Tochigishi, Japan, assignors to Kabushiki Kaisha Mitsui Miike Seisakusho, Nihonbashi-Muromachi, Japan

Filed Jan. 7, 1982, Ser. No. 337,572
Claims priority, application Japan, Feb. 17, 1981, 56-21943
Int. Cl.³ C02F *3/16*
U.S. Cl. 210—608 **4 Claims**

1. An activated sludge process sewage treatment method for fluid received in a pressurized aeration tank (1) with an inner barrel (19) and an axial flow impeller (23) mounted therein at a lower end thereof, said aeration tank forming an outer barrel (18), said inner barrel (19) having a cylindrical configuration and being arranged so that the ratio of the inside diameter d of the inner barrel (19) to the outside diameter d_a of the axial flow impeller (23) is selected within the range of $d/d_a \leqq 1.01$, and said inner barrel is formed of such dimensions that the ratio d/D of the inside diameter d of the inner barrel (19) to the inside diameter D of the outer barrel (18) of the aeration tank (1) is selected in the range of 0.2 to 0.4, comprising:

keeping pressure in the pressurized aeration tank (1) in the range of 2 to 5 Kg/cm^2G;

driving an axial flow impeller in the tank at a peripheral speed selected in the range of 8 to 15 m/s, said axial flow impeller (23) including a plurality of blades (24) having an aerofoil sectional configuration with a specific speed in the range of 900 to 3000 rpm $\sqrt{m^3/min}/m^{3/4}$



including aerobic microorganisms of *Opercularia* group in the fluid;

flowing the fluid upwardly through an annular passage defined between outer and inner barrels (18) and (19) with a flow velocity V_o in the range of 0.2 to 0.4 m/s the tank and flowing fluid downwardly through the inner barrel, and

circulating fluid in the aeration tank (1) with the mean number of recirculation cycle being at least 70.

4,430,226
METHOD AND APPARATUS FOR PRODUCING ULTRAPURE WATER

Ramesh S. Hegde, Chelmsford, and Gary C. Ganzi, Lexington, both of Mass., assignors to Millipore Corporation, Bedford, Mass.

Filed Mar. 9, 1981, Ser. No. 241,792
Int. Cl.³ C02F *1/42, 1/04, 1/44*
U.S. Cl. 210—638 **12 Claims**

1. The method for providing substantially de-ionized water with reduced organic contamination which comprises passing water through a cartridge containing a particulate admixture of activated carbon and mixed ion exchange resins.

5. The method according to any one of claims 1–4 wherein said water is pretreated by distillation, ion-exchange, ultrafiltration, reverse osmosis, or a combination thereof.

4,430,227
METHOD OF CONCENTRATING AQUEOUS SOLUTIONS

Donald N. Hanson, Orinda, and Scott Lynn, Walnut Creek, both of Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Filed Aug. 18, 1980, Ser. No. 178,870
Int. Cl.³ B01D *11/04*
U.S. Cl. 210—642 **10 Claims**

1. A method of concentrating an aqueous solution of a non-volatile ionic solute in stages from a low concentration to an intermediate higher concentration and then to a highest concentration, said method comprising:

(a) providing first, second and third extraction zones for direct, intimate, countercurrent contact between such aqueous solution and a water immiscible, polar, organic solvent having low solubility for water at ambient temperatures and having an enhanced solubility for water at an elevated temperature, said polar organic solvent being stable and unreactive with the aqueous solution and solute and with the equipment employed and having low solvent power for the solute

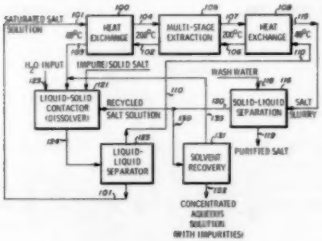
(b) causing continuous, intimate, countercurrent contact between such solution of lowest concentration and such solvent in the first contact zone and at an elevated temperature and continuously withdrawing from such zone a stream of wet solvent and a stream of solution of intermediate concentration,

(c) cooling the effluent stream of wet solvent and a portion of the effluent stream of solution from the first zone,

(d) separating water from the cooled stream of solvent,

(e) causing continuous, intimate, counter-current contact in said second zone between the thus dewatered solvent and the thus cooled portion of solution, the contact being carried out at a temperatuure such that water is extracted from the solvent to provide a drier solvent and the solution is diluted,

(f) continuously withdrawing the diluted solution and the drier solvent from the second zone,



(g) heating the diluted solution so withdrawn and recycling it to the first zone,

(h) reheating the drier solvent stream withdrawn from the second zone and causing continuous intimate, countercurrent contact thereof with the remainder of the solution withdrawn from the first zone, such contact being carried out in the third zone and resulting in the extraction of water from the solution and production of a solution of highest concentration and of solvent containing the water that is extracted,

(i) continuously withdrawing from the third zone a stream of solution of highest concentration and a stream of solvent containing extracted water and,

(j) recycling the solvent stream thus withdrawn from the third zone to the first zone.

4,430,228

PROCESS FOR REMOVING DISSOLVED IRON FROM WATER

Laurene O. Paterson, P.O. Box 953, 1219 E. Church St., Adrian, Mich. 49221

Continuation-in-part of Ser. No. 103,322, Dec. 14, 1979, abandoned, Ser. No. 145,657, May 2, 1980, abandoned, and Ser. No. 210,923, Nov. 28, 1980, abandoned. This application Mar. 5, 1982, Ser. No. 355,163

Int. Cl.³ B01D *15/00*

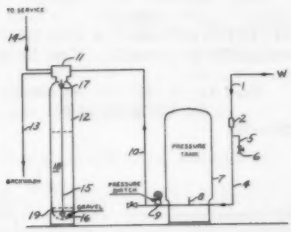
U.S. Cl. 210—665 **22 Claims**

1. A process for removing iron from water which comprises the steps of:

(1) subjecting water having iron therein to high turbulence and high shear to a degree sufficient to colloidalize existing insoluble iron hydrates and form colloidally dispersed iron hydrates from substantially all the dissolved iron present, thereby providing the iron in the form of micelles having a surface charge;

(2) maintaining the so-treated water under a pressure within the range from about 10 to 500 psig;

(3) passing the water containing the iron hydrate micelles within said pressure range through a bed of particulate material having electrostatically charged surface area



capable of adsorbing and removing from the water said iron hydrates; and

(4) recovering water having low iron residuals.

4,430,229

IMMUNE ADSORBENT AND ADSORBING DEVICE

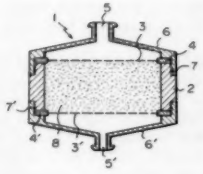
Naokuni Yamawaki, and Katsunori Horikoshi, both of Fuji, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed May 17, 1982, Ser. No. 378,924

Claims priority, application Japan, May 22, 1981, 56-76776; Dec. 3, 1981, 56-193735

Int. Cl.³ B01D *15/00*

U.S. Cl. 210—692 **9 Claims**



9. A method for removing at least one of an autoantibody and an immune complex from body fluid, comprising contacting body fluid containing at least one of an autoantibody and an immune complex with an adsorbing material comprising a water-insoluble carrier, which is a hydroxyl group-containing crosslinked copolymer having a specific surface area of at least 5 m^2/g, and at least one member selected from low-molecular weight substances containing a purine base or pyrimidine base as a constituent element, which is fixed to said carrier.

4,430,230

METHOD FOR REMOVAL OF IMPURITIES FROM LIQUID MIXTURES

Takeo Satake, Wakayama, Japan, assignor to Nippon Chemtec Consulting Inc., Osaka, Japan

Filed Oct. 28, 1980, Ser. No. 201,605

Claims priority, application Japan, Oct. 30, 1979, 54-140974; Dec. 24, 1979, 54-168961; May 12, 1980, 55-063001

Int. Cl.³ B01D *15/00*

U.S. Cl. 210—691 **11 Claims**

1. A method for removal of oily or solid impurities from an impurities-containing liquid mixture wherein the impurities are emulsified or finely suspended in a liquid medium, which comprises kneading the impurities-containing liquid mixture with a viscoelastic material in a viscoelastic state which has an affinity with said impurities, has substantially no affinity with said liquid medium, has a viscoelasticity and shows a spinnability when a shearing force is given thereto with a kneader at a temperature of 0° to 100° C. and thereby having the viscoelas-

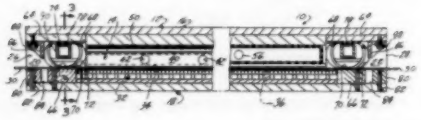
tic material take up the impurities and separating out the purified liquid medium from the kneading system.

4,430,231

FILTERING APPARATUS AND METHOD

Jack Bratten, 5970 St. James Dr., West Bloomfield, Mich. 48033

Filed Aug. 5, 1982, Ser. No. 405,524
Int. Cl.³ B01D *33/04*
U.S. Cl. 210—783 **14 Claims**



1. A filtering apparatus comprising the elements of:
a rigid filter housing including an internal filter chamber;
said filter housing defining at least one elongated opening extending into said chamber;
a filter element adapted to be passed into said filter chamber through said opening so as to be movable into and out of said filter chamber;
said filter element located beneath a space in said filter chamber;
inlet means for directing fluid to be filtered under pressure into said filter chamber space above said filter element;
filter element support means mounted within said housing and having an upper face located to receive said filter element thereon, said support means including clearance spaces enabled to receive fluid flow through said filter element;
outlet means for collecting said fluid flow passed through said filter element and support means;
sealing means for sealing said filter chamber opening comprising a flexible tube segment and means mounting said tube segment extending across and within said opening, said tube segment configured to move into sealing engagement with the perimeter of said opening upon pressurization thereof;
said elongated opening defined by opposing top and bottom surfaces, and a pair of side members wherein said side members are each formed with a side opening through which each end of said tube segment passes to be coextensive with said top and bottom opposing surfaces, each of said side openings having an internal surface configured to be sealed by said respective tube segment ends upon pressurization thereof said elements being relatively positioned to enable sealing of said filter housing openings to be achieved solely by sealing engagement of said tube segment with said top and bottom member opposing surfaces and with said side openings internal surface;
control means for selectively pressurizing or depressurizing said tube segment, to thereby controllably seal said opening and said side openings during operation of said filtering apparatus.

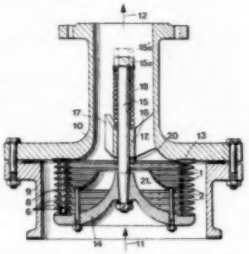
14. A method of filtering comprising the steps of disposing a flexible element within the interior of a substantially rigid filter housing, said filter housing having an elongated opening through which said flexible filter element is disposed during a filtration cycle, with a filter chamber defined within said filtering housing above the upper surface of said flexible filtering element;
disposing said flexible filtering element overlying a support which is adapted to receive flow through said filter element;
sealing said elongated opening by the step of pressurizing a flexible tube segment disposed within said elongated opening extending thereacross, said flexible tube segment being passed through a pair of side openings formed in said housing adjacent said elongated housing, such that upon pressurization the exterior thereof moves into sealing engagement with said filter element and said surfaces of said elongated opening and said side openings;
establishing a filter cycle by directing a flow of liquid into said filter chamber and collecting the filtered liquid after passing through said filter elements;
depressurizing and at least partially evacuating said tube segment after each filtration cycle;
moving said filter element with the accumulated solids thereon out of said filter chamber and removing said accumulated solids.

4,430,232

DISC FILTER FOR LIQUIDS

Charles Doucet, 20, avenue Tronchet, 1226 Thonex, Switzerland

Filed Feb. 1, 1982, Ser. No. 344,519
Int. Cl.³ B01D *25/18, 29/38*
U.S. Cl. 210—798 **15 Claims**



1. A disc filter body for a filter of the counter-current flow cleaning type, comprising: a series of coaxial annular shaped solid filter elements having a hydrodynamic lenticular cross-section, said elements each having circumferentially-spaced alveoli located on opposite sides of the elements; resiliently yieldable spacer elements located in said alveoli, each spacer element having a central channel in alignment with the channels of adjacent spacer elements, capable of being opened or substantially closed by varying the pressure exerted on said spacer elements, thereby forming a generally cylindrical shaped assembly providing annular filtering passages between said filter elements and a central cylindrical flow channel extending axially along the length of said assembly; and means for varying the distance between said filter elements by varying pressure exerted on the spacer elements for changing said filter body from a filtering mode to a cleaning mode.

4,430,233

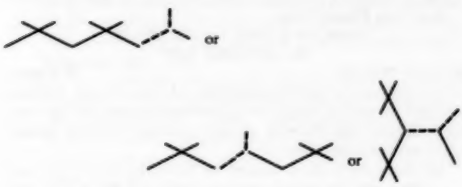
BRANCHED CHAIN KETONES AND USES THEREOF IN AUGMENTING OR ENHANCING THE AROMA OF PERFUMES, COLOGNES AND PERFUMED ARTICLES AND THE PROCESS FOR PREPARING SAME

Richard M. Boden, Monmouth Beach, and Theodore J. Tyszkiewicz, Sayreville, both of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

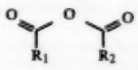
Division of Ser. No. 296,868, Aug. 27, 1981, Pat. No. 4,374,276.
This application Jun. 4, 1982, Ser. No. 384,960
Int. Cl.³ D06M *13/20*
U.S. Cl. 252—8.6 **1 Claim**

1. A process for augmenting or enhancing the aroma of a fabric softener composition or a drier-added fabric softener article comprising the step of adding to a drier-added fabric softener article component or a fabric softener composition, an aroma augmenting or enhancing quantity of a product prepared by the process of (a) trimerizing isobutylene to form

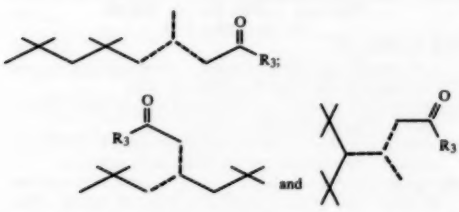
triisobutylene, a mixture of substances defined according to the structures:



wherein in each of the molecules one of the dashed lines is a carbon-carbon double bond and the other of the dashed lines is a carbon-carbon single bond and (b) reacting the resulting triisobutylene composition of matter with an alkanoic acid anhydride having the structure:



wherein R_1 and R_2 are the same or different and are each selected from the group consisting of methyl and ethyl, in the presence of a Lewis acid catalyst thereby producing a mixture of compounds comprising the compounds defined according to the structures:



wherein R_3 represents methyl or ethyl and in each of the molecules one of the dashed lines represents a carbon-carbon double bond and each of the other of the dashed lines represents a carbon-carbon single bond.

4,430,234

MACHINING FLUID OF WATER SOLUBLE TYPE USING ORGANIC SURFACTANTS

Masami Hasegawa, Fuji, and Takashi Kato, Kamakura, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jul. 6, 1982, Ser. No. 395,838

Claims priority, application Japan, Jul. 10, 1981, 56-107757

Int. Cl.³ C10M *1/06*

U.S. Cl. 252—49.5 **17 Claims**

1. A machining fluid for use in machining of metal materials, comprising:

water;

5 to 20 parts by weight of a surface-active component which is selected from the group consisting of erythritol fatty acid esters and glycerol fatty acid esters;

3 to 15 parts by weight of a sorbitan fatty acid ester;

3 to 15 parts by weight of an alkylolamide of a fatty acid;

3 to 10 parts by weight of propylene glycol;

1 to 5 parts by weight of a chelating agent for metal ions; and

0.5 to 3 parts by weight of a fluorine-containing surface-active agent.

4,430,235

POLYMERIC ANTIOXIDANTS

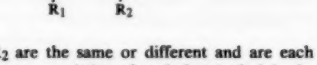
Nan S. Chu, Hartsdale, and Lawrence Marlin, Yorktown Heights, both of N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Jul. 17, 1981, Ser. No. 284,389

Int. Cl.³ C07F *7/08, 7/10*; C10M *3/22, 3/44*

U.S. Cl. 252—49.6 **5 Claims**

1. A polymeric antioxidant of the formula:



wherein x ranges from 2 to 100, y ranges from 20 to 300, the ratio of x:y is at least 1:10, n ranges from 2 to 12, X is selected from the group consisting of —NH—, —NHR—, —O— and —CHN—, n ranges from 2 to 12, X is selected from the group consisting of —NH—, —NHR—, —O— and —CHN—, and and Ant is an aromatic antioxidant moiety.

4,430,236

LIQUID DETERGENT COMPOSITION CONTAINING BLEACH

T. Chandler Franks, Mauldin, S.C., assignor to Texize, Division of MortonThiokol, Greenville, S.C.

Filed Jun. 22, 1981, Ser. No. 275,791

Int. Cl.³ C11D *3/395, 7/54*; D06L *3/00*

U.S. Cl. 252—95 **25 Claims**

1. A generally single phase substantially phosphate free liquid aqueous solution for use as a laundry detergent and bleach comprising:

a detergency effective amount of a member selected from the group consisting of a nonionic surfactant or a mixture of a nonionic surfactant and an anionic surfactant;

hydrogen peroxide bleach present in an amount equivalent to about 1 to about 20 percent by weight of a 50 percent by weight aqueous solution of hydrogen peroxide;

a fluorescent brightening agent present in an amount of from about 0.01 to about 2.0 percent by weight; and

an aqueous medium;

and wherein said single phase liquid has a loss of less than four and one half percent (4.5%) of original hydrogen peroxide content in two (2) months at 77 degrees F.

4,430,237

LIQUID DETERGENT HAVING HIGH GREASE REMOVAL ABILITY

Robert C. Pierce, Plainsboro, and Frank J. Bala, Jr., South Amboy, both of N.J., assignors to Colgate-Palmolive Co., New York, N.Y.

Filed Oct. 16, 1981, Ser. No. 311,824

Int. Cl.³ C11D *1/66, 1/83, 17/08*

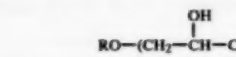
U.S. Cl. 252—173 **3 Claims**

1. A liquid detergent composition consisting essentially of about 15% to 40% by weight of a nonionic mixture of higher alkyl glyceryl ether surfactants having the structural formula:

where R is an alkyl radical containing 8 to 16 carbons, and n has a value of 1 to 3, said mixture containing 12% to 40% by weight of glyceryl ethers where n is 1, 24% to 61% by weight of glyceryl ethers where n is 2 and 6% to 50% by weight of glyceryl ethers where n is 3, and an additional anionic or nonionic surface active agent in an aqueous vehicle, the weight ratio of said additional surface active agent to said glyceryl ether mixture being in the range of 10:1 to 1:10.

2. A water-soluble detergent composition consisting essen-

tially of, by weight, a nonionic mixture of higher alkyl glyceryl ether surfactants having the structural formula:



where R is an alkyl radical containing 8 to 16 carbons, and n has a value of 1 to 3, said mixture containing about 12% glyceryl ethers where n is 1, about 24% of glyceryl ethers where n is 2 and about 54% of glyceryl ethers where n is 3.

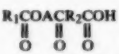
4,430,238

ESTERIFIED DICARBOXYLIC ACID AND ITS USE

Karl M. E. Hellsten, Ödsmal, and Anders W. Klingberg, Henan, both of Sweden, assignors to Berol Kemi AB, Stenungsund, Sweden

Filed May 10, 1982, Ser. No. 376,338
Claims priority, application Sweden, May 18, 1981, 8103099
Int. Cl.³ B03D 3/00; C22B 3/00
U.S. Cl. 252—61 7 Claims

1. A process for the froth flotation of oxide minerals and salt minerals which comprises carrying out the froth flotation in the presence as a collector reagent of an esterified dicarboxylic acid having the general formula



in which R_1 is aliphatic hydrocarbon having from seven to twenty-one carbon atoms, R_2 is hydrocarbon having from two to six carbon atoms and A is oxyalkylene having from two to four carbon atoms.

4,430,239

FERROFLUID COMPOSITION AND METHOD OF MAKING AND USING SAME

John E. Wyman, Lexington, Mass., assignor to Ferrofluidics Corporation, Nashua, N.H.

Continuation-in-part of Ser. No. 313,654, Oct. 21, 1981, abandoned. This application Feb. 7, 1983, Ser. No. 464,480
Int. Cl.³ H01F 1/10
U.S. Cl. 252—62.51 29 Claims

1. A stable ferrofluid composition, which composition comprises a colloidal dispersion of finely-divided magnetic particles in a liquid carrier and a dispersing amount of a dispersing agent, which agent comprises an acid phosphoric acid ester of a long-chain alcohol, the long-chain alcohol compatible with the liquid polar carrier.

4,430,240

DE-ICING CHEMICALS AND THEIR PREPARATION FROM POLYSACCHARIDE SOURCES

Robert L. Sandvig; William A. Klemm; Jack R. Gaines, and Robert W. Looyenga, all of Rapid City, S. Dak., assignors to State of South Dakota as represented by the Department of Transportation, Pierre, S. Dak.

Filed Jan. 12, 1982, Ser. No. 338,848
Int. Cl.³ C09K 3/18
U.S. Cl. 252—70 48 Claims

1. The method of de-icing which comprises contacting an iced surface with a de-icing chemical, said chemical consisting essentially of a mixture of alkaline earth metal salts of acetic acid, lactic acid, and glycolic acid with the mixture being substantially free of alkaline earth metal salts of oxalic acid or formic acid.

4,430,241

MIXED NITRATE SALT HEAT TRANSFER MEDIUM AND PROCESS FOR PROVIDING THE SAME

Louis C. Fiorucci, Hamden, Conn., assignor to Olin Corporation, New Haven, Conn.

Filed Jul. 1, 1982, Ser. No. 394,192
Int. Cl.³ C09K 5/06
U.S. Cl. 252—70 25 Claims

1. A process for preparing particles of a non-friable, eutectic mixture of sodium nitrate and potassium nitrate for use as a heat transfer and thermal storage medium for solar power stations comprising steps of:

(a) preparing a fluid mixture of between about 70% and about 30% by weight sodium nitrate and about 30% and about 70% by weight potassium nitrate, wherein said fluid mixture has a combined level of sulfates, oxides, carbonates and chlorides of no more than about 0.7% by weight and with the chloride being no more than about 0.2% by weight;

(b) granulating said fluid mixture by a process selected from the group consisting of shock chilling and spray graining to form substantially homogeneous particles of said mixture; and

(c) recovering a salt product comprised of particles having a predetermined mesh size.

4,430,242

NOVEL ROAD AND HIGHWAY DEICER AND TRACTION AGENT, AND PROCESS FOR ITS MANUFACTURE

Alan B. Gancy, 265 Robineau Rd., Syracuse, N.Y. 13207

Filed Aug. 2, 1982, Ser. No. 404,365
Int. Cl.³ C09K 3/18
U.S. Cl. 252—70 8 Claims

1. A process for manufacturing a combined deicing and traction agent comprising the following steps:

(a) introducing crushed raw limestone into a rotary kiln or equivalent agitated reaction vessel;

(b) adding aqueous acetic acid at a concentration of 50–90% by weight to the crushed raw limestone, with agitation;

(c) regulating the total relative amount of acetic acid such that the mole ratio of acid, anhydrous basis, to calcium compounds in the limestone is in the range 0.4–3.0;

(d) agitating the reaction batch for a period of time sufficient to achieve substantially complete reaction; and

(e) drying the damp intermediate product of said reaction in a conventional manner to produce a dry, free-flowing product.

4,430,243

BLEACH CATALYST COMPOSITIONS AND USE THEREOF IN LAUNDRY BLEACHING AND DETERGENT COMPOSITIONS

Charles D. Bragg, Newcastle upon Tyne, England, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jul. 30, 1982, Ser. No. 403,376
Claims priority, application United Kingdom, Aug. 8, 1981, 8124302; Dec. 16, 1981, 8137967; Jun. 1, 1982, 8215890
Int. Cl.³ C11D 3/04, 3/39, 11/00; D06L 3/02
U.S. Cl. 252—91 7 Claims

1. A laundry detergent composition comprising from about 0% to about 40% of surfactant selected from anionic, nonionic, ampholytic and zwitterionic surfactants and mixtures thereof, from about 5% to about 90% of inorganic or organic detergency builder, from about 5% to about 35% of particulate peroxygen bleaching agent, and from about 0.05% to about 2% of a catalyst system soluble in water at pH 10 and comprising a dry mixture of:

(a) a first particulate component comprising a catalytic heavy metal cation having a catalytic activity for decomposition of the peroxygen bleaching agent of at least 10%, selected from the group consisting of cations of vanadium,

chromium, manganese, iron, cobalt, copper, osmium, platinum, palladium, silver, mercury, and lead,

(b) a second particulate component comprising an auxiliary metal cation having a catalytic activity for decomposition of the peroxygen bleaching agent of less than 10%, selected from the group consisting of cations of zinc, aluminum and nickel, and

(c) a water soluble sequestrant selected from the group consisting of ethylenediaminetetraacetic acid, diethylenetriaminepentaacetic acid, ethylenediaminetetra-(methylenephosphinic acid), diethylenetriaminepenta-(methylene phosphonic acid), and alkali-metal and alkaline-earth metal salts thereof,

wherein the molar ratio of the sum total of (auxiliary metal cation+catalytic heavy metal cation) to sequestrant is in the range from 1:1 to 20:1 and the molar ratio of sequestrant to catalytic heavy metal cation is in the range from 1:1 to 40:1.

4,430,244
SILICATE-FREE BLEACHING AND LAUNDERING COMPOSITION

Guy Broze, Grace-Hollogne, and Leopold Laitem, Orp-le-Grand, both of Belgium, assignors to Colgate-Palmolive Company, New York, N.Y.

Filed Mar. 4, 1982, Ser. No. 354,861
Int. Cl.³ C11D *3/395*
U.S. Cl. 252—94 **9 Claims**

1. A process for bleaching which comprises contacting the stained and/or soiled material to be bleached with an aqueous solution of a granular bleaching detergent composition comprising:

(a) a bleaching agent comprising a peroxygen compound in combination with an activator therefor; and,

(b) at least one surface active agent selected from the group consisting of anionic, cationic, nonionic, ampholytic and zwitterionic detergents; said bleaching detergent composition being substantially free of silicate compounds.

4,430,245
SOAP COMPOSITION

Ian A. M. Beattie, Birkenhead, England, assignor to Internationale Octrooi Maatschappij "Octropa" B.V., Rotterdam, Netherlands

Filed Apr. 6, 1981, Ser. No. 251,703
Int. Cl.³ C11D *9/30, 15/04, 9/22*
U.S. Cl. 252—117 **4 Claims**

1. A thickened single liquid phase aqueous soap composition having a viscosity of from 2000 to 10,000 cps, said composition comprising in addition to water:

(i) from about 10 to about 25% by weight of a water-soluble or water-dispersible fatty acid soal selected from the group consisting of monoethanolamine fatty acid soaps, diethanolamine fatty acid soaps and mixtures thereof, the fatty acid moiety being derived from a mixture of fatty acids having a carbon chain of from 10 to 18 carbon atoms, the fatty acids being predominantly C_{10} to C_{14};

(ii) a first thickening agent selected from the group consisting of C_{12} to C_{18} fatty acid alkanolamides and mixtures thereof;

(iii) a second thickening agent selected from the group consisting of C_{12} to C_{18} fatty acids and mixtures thereof, the first and second thickening agents together forming from about 1% to about 4% by weight of the composition; and

(iv) an effective amount of a perfume, the composition being characterized by its freedom from the problem of phase separation which may occur with other aqueous liquid soap compositions which have a viscosity exceeding 2000 cps and contain a perfume in combination with a soap other than as defined in (i).

4,430,246
GRANULATE CONSISTING OF HYDRATED SODIUM TRIPOLYPHOSPHATE AND WATER-INSOLUBLE ALUMINO SILICATE ION EXCHANGER MATERIAL

Günter Sorbe; Horst-Dieter Wasel-Nielen, both of Hürth, and Joachim Kandler, Erftstadt, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Knapsack, Fed. Rep. of Germany

Continuation of Ser. No. 39,843, May 17, 1979, abandoned. This application Apr. 7, 1983, Ser. No. 482,839
Claims priority, application Fed. Rep. of Germany, May 22, 1978, 2822231
Int. Cl.³ B01J *2/00*; **C11D** *3/06, 3/12, 11/00*
U.S. Cl. 252—140 **3 Claims**

1. In a granulate comprising particles having sizes substantially within the range 0.15 to 1.25 mm, the granulate consisting essentially of:

(a) about 1 to 99 weight % of partially or completely hydrated sodium tripolyphosphate containing water of hydration in a proportion of at least about 10 weight %, based on the theoretically possible water content and having been made from the anhydrous sodium tripolyphosphate, and

(b) about 99 to 1 weight % of a water-insoluble alumino silicate ion exchanger material of the general formula

$$(Cat_{2/n}O)_x.Me_2O_3.(SiO_2)_y.z\ H_2O$$

in which Cat stands for a calcium exchangeable cation with the valency n, x is 0.7 to 1.5, Me stands for Aluminium, y is 0.8 to 6, and z is 1.8 to 13.5

the improvement wherein the anhydrous sodium tripolyphosphate contains about 20 to 80 weight % of phase-I material prior to hydration and the balance being phase-II;

the alumino silicate ion exchanger material being a type A zeolite of the formula $[Na_2O.Al_2O_3.(SiO_2)_2.4.5\ H_2O]$, the material being anhydrous and having the following particle size distribution according to Andreasen prior to granulation:

15 μm: 97–99%
10 μm: 94–97%
1 μm: 1–5%

corresponding to an average diameter of the particles of 3 to 5 microns;

and the granulate presenting the following particle size distribution (Tyler Standart Sieve Analysis Scale)

Mesh number	Retained on sieve, weight %
>12	3.6–13.4
>16	11.0–20.5
>20	19.4–29.1
>35	65.6–90.4
>65	91.7–98.9
>100	97.5–99.8
<100	2.5– 0.1

4,430,247
PROCESS FOR PREPARING AN OXYALKYLATED PRODUCT

Arthur L. Austin, Southgate; William W. Levis, Jr., Wyandotte; Louis C. Pizzini, Trenton, and Robert J. Hartman, Southgate, all of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Continuation of Ser. No. 590,332, Jun. 25, 1975, Pat. No. 4,097,399. This application Sep. 29, 1977, Ser. No. 837,935
Int. Cl.³ C09K *3/00*
U.S. Cl. 252—182 **10 Claims**

1. A process for preparing an oxylkylated product which comprises

(1) providing a mixture containing

(a) a phenol, at least in an amount sufficient to form a

complex with an aluminum or iron substance in the mixture,

(b) an organic acid anhydride in an amount up to about 1:1 mole ratio of phenol to anhydride, and

(c) a substance containing aluminum or iron which will form a complex with the phenol,

(2) heatng the mixture to a temperature in the range of from about 80 degrees to about 250 degrees C., and

(3) oxyalkylating the heated mixture by adding thereto sufficient alkylene oxide having from 2 to 12 carbon atoms to form an oxyalkylated product.

4,430,248

CATIONIC POLYMERS FOR REDUCTION OF VISCOSITY OF A MAGNESIUM HYDROXIDE SLURRY

Paul R. Rey, Coraopolis, Pa., assignor to Calgon Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 271,469, Jun. 8, 1981, abandoned. This application Sep. 17, 1981, Ser. No. 303,305

Int. Cl.³ B01J *13/00*; **F17D** *1/16, 1/18*

U.S. Cl. 252—313 R **6 Claims**

1. A method for reducing the viscosity of a magnesium hydroxide aqueous slurry which comprises adding 5 pounds/-ton or less of a cationic polymer selected from the group consisting of methacryloyloxyethyl trimethyl ammonium methosulfate, vinyl benzyl trimethyl ammonium chloride, dimethyldiallyl ammonium chloride and 3-acrylamido-3-methyl butyl trimethyl ammonium chloride, to the magnesium hydroxide slurry.

4,430,249

PREPARATION OF AQUEOUS SUSPENSIONS OF TALC

Leonard F. Gate, St. Austell, England, assignor to English Clays Lovering Pochin & Co., Ltd., St. Austell, England

Filed Oct. 22, 1981, Ser. No. 313,816

Claims priority, application United Kingdom, Oct. 23, 1980, 8034180

Int. Cl.³ B01J *13/00*; **C04B** *31/40*; **C08K** *7/00*; **C09C** *3/06*

U.S. Cl. 252—313 R **10 Claims**

9. A process for preparing an aqueous suspension of talc which process comprises contacting the talc, in a finely divided form, with an aqueous solution of an alkali metal hydroxide or ammonium hydroxide, washing the talc after contact with said aqueous solution, thermally drying the washed talc to remove at least a substantial proportion of the water associated therewith, and then suspending the thermally dried talc in water which contains a dispersing agent.

4,430,250

SURFACE-ACTIVE OLIGOMERS

Henri Sebag, Paris, and Guy Vanlerberghe, Claye-Souilly, both of France, assignors to L'Oreal, Paris, France

Filed Jul. 20, 1981, Ser. No. 285,422

Claims priority, application Luxembourg, Jul. 21, 1980, 82646

Int. Cl.³ B01F *17/42*

U.S. Cl. 252—351 **9 Claims**

1. A surface-active random oligomer having the formula

$$R_1—O\text{-}\overline{C_2H_3(Z)—O}\text{-}_{\overline{m}}H$$

wherein

R_1 represents a linear or branched, saturated or unsaturated aliphatic hydrocarbon radical, a cycloaliphatic radical, an aromatic radical or an alkyl aromatic radical, containing up to 30 carbon atoms,

Z represents a mixture of (i) A and (ii) a group of the formula $R_2—O—\overline{[C_2H_3(A)—O]}_{\overline{n}}\ CH_2—$ or a mixture of said groups, wherein A represents a hydrophilic group, R_2 represents a linear or branched, saturated or unsaturated aliphatic hydrocarbon radical, a cycloaliphatic radical, an aromatic radical or an alkylaromatic radical, containing 8 to 30 carbon atoms,

n represents an average statistical value ranging from 1 to 20, and

m represents an average statistical value ranging from 0.5 to 10.

4,430,251

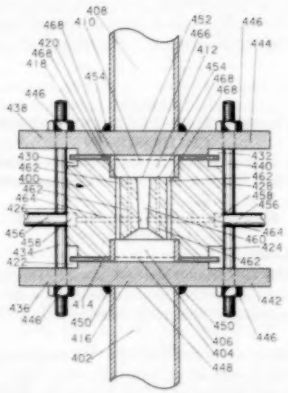
HIGH ENERGY EMULSIFIER

William P. Patterson, and Ronald J. Bailey, both of Jacksonville, Fla., assignors to Hoffert Manufacturing Co., Inc., Jacksonville, Fla.

Filed Sep. 29, 1981, Ser. No. 307,319

Int. Cl.³ B01F *5/08*; **B01J** *13/00*

U.S. Cl. 252—359 R **5 Claims**



1. An emulsifying apparatus comprising:

an inlet side and a first chamber, having a first cross-sectional area;

an outlet side and a second chamber, having a second cross-sectional area;

a passageway having a cross-sectional area smaller than said first and second cross-sectional areas, an inlet in fluid communication with said first chamber and an outlet in fluid communication with said second chamber, said passageway being long enough and having a cross-sectional area small enough that fluids will vaporize during passage between said first and second chambers; and

said passageway comprising a central venturi tube in fluid communication with at least one inlet chamber, said venturi tube being surrounded by a plurality of fluid-carrying passageways of uniform cross-section extending parallel to the longitudinal axis of said venturi tube.

4,430,252

PROCESS FOR SYNTHESIZING A MULTICOMPONENT ACIDIC CATALYST COMPOSITION BY AN ORGANIC SOLUTION METHOD

Ji-yong Ryu, Ramsey, N.J., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Dec. 10, 1982, Ser. No. 448,697

Int. Cl.³ B01J *31/12, 21/02, 27/14*

U.S. Cl. 502—162 **27 Claims**

1. A process for preparing a catalyst composition which comprises:

(1) reacting in admixture at least one Metal Hydrocarboxide I, at least one Metal Hydrocarboxide II, at least one acidic phosphorus-oxygen containing compound, and water in the presence of at least one liquid organic medium comprising at least 50% by weight, based on the weight of said medium, of at least one member selected from the group consisting of organic aldehyde, organic ketone, and or-

ganic ether, said reaction being conducted in a manner sufficient to (a) avoid contact of Metal Hydrocarboxides I and II with water prior to contact of Metal Hydrocarboxide I and II with the acidic phosphorus-oxygen containing compound, and (b) form a catalyst precursor composition;

(2) separating said catalyst precursor composition from said reaction admixture;

(3) calcining said catalyst precursor composition to form said catalyst composition;

wherein said process:

(i) the metal M^1, of said Metal Hydrocarboxide I is selected from at least one member of the group consisting of Al, Ga, In, and Tl; and

(ii) the metal, M^2, of said Metal Hydrocarboxide II is selected from at least one member of the group consisting of Si, Sn, and Ge.

4,430,253

SULFIDE-MODIFIED RUTHENIUM CATALYST

Michael Dubeck, Birmingham, and Gordon G. Knapp, Southfield, both of Mich., assignors to Ethyl Corporation, Richmond, Va.

Filed Feb. 11, 1982, Ser. No. 348,026
Int. Cl.³ B01J *27/02*
U.S. Cl. 502—185 **5 Claims**

1. A process for the preparation of a catalyst for the conversion of higher polydric alcohols to lower polyhydric alcohols, said process comprising the steps of:

(a) suspending a catalyst containing from about 0.1 weight percent to about 10 weight percent ruthenium on a support in a carbohydrate solution containing 30–70 weight percent of carbohydrate,

(b) hydrogenating said carbohydrate solution at a temperature of from about 50° C. to about 200° C. at about 50 to about 3000 psig of hydrogen to convert said carbohydrate to a higher polyhydric alcohol,

(c) adding a sulfide-containing solution in an amount sufficient to provide from about 0.2 to about 5.0 moles of sulfide per mole of ruthenium and

(d) heating said carbohydrate solution from about 150° C. to about 300° C. for a period sufficient to convert said higher polyhydric alcohols to said lower polyhydric alcohols.

4,430,254

SPHERICAL CERIUM-ACTIVATED CATALYST FOR AMMONIA SYNTHESIS AND PROCESS FOR ITS MANUFACTURE

Attilio Passariello, Tivoli, Italy, assignor to Ammonia Casale S.A., Lugano, Switzerland

Continuation of Ser. No. 117,780, Feb. 1, 1980, Pat. No. 4,308,174. This application Sep. 23, 1981, Ser. No. 305,037
Claims priority, application Italy, Feb. 7, 1979, 47920 A/79
The portion of the term of this patent subsequent to Dec. 29, 1998, has been disclaimed.
Int. Cl.³ B01J *29/06*
U.S. Cl. 502—243 **6 Claims**

1. An unreduced, porous, non-brittle catalyst for ammonia synthesis demonstrating a resistance to thermal stress and chemical poisoning and having a low pressure drop and having catalytic activity in the temperature range of 370° C. to 450° C., consisting essentially of:

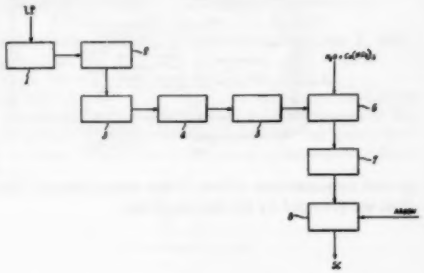
magnetite having a FeO content of 26–30%, based on the weight of the magnetite;

2.0–3.5% aluminum oxide;

0.1–0.4% magnesium oxide;

0.2–0.5% silica; and

0.5–2.5% metallic cerium,



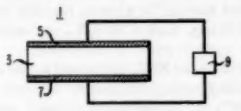
in the form of pelletized spheres having diameters in the range of 1.0 to 25 mm.

4,430,255

NON-OHMIC DEVICE USING TiO_2

Man F. Yan, Berkeley Heights, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Continuation-in-part of Ser. No. 144,171, Apr. 25, 1980, abandoned. This application Sep. 1, 1982, Ser. No. 413,751
Int. Cl.³ H01B *1/02*
U.S. Cl. 252—512 **15 Claims**



1. A device comprising a layer, said layer comprising TiO_2 and at least two additives; and

two electrical contacts to said layer;

characterized in that

a first said additive is at least one element selected from the group consisting of elements of Group IIA of the Periodic Table, said first additive being present in an amount greater than 0.0 mole percent and less than 1.0 mole percent and a second said additive is at least one element selected from the group consisting of elements of Group VB of the Periodic Table, said second additive being present in an amount greater than 0.0 mole percent and less than 5.0 mole percent; said device being a nonohmic device or a ceramic capacitor.

4,430,256

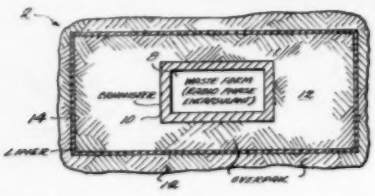
REVERSE THERMODYNAMIC CHEMICAL BARRIER FOR NUCLEAR WASTE OVER-PACK OR BACKFILL

Roy Rustum, 528 S. Pugh, State College, Pa. 16801

Filed Jul. 6, 1981, Ser. No. 280,193
Int. Cl.³ G21F *9/16*
U.S. Cl. 252—628 **22 Claims**

1. A nuclear waste package comprising any material containing a radionuclide and a surrounding overpack or backfill containing a non-radioactive compound of the element or

analogue of the element of the radionuclide or a natural or synthetic mineral containing an actinide which provides a



greater concentration of ions of the non-radioactive elements than are provided by the radionuclides.

4,430,257

ALCOHOL-FREE ALKOXIDE PROCESS FOR CONTAINING NUCLEAR WASTE

James M. Pope, Monroeville, and Edward J. Lahoda, Edgewood, both of Pa., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jun. 12, 1981, Ser. No. 272,852
Int. Cl.³ G21F 9/16
U.S. Cl. 252—629 **14 Claims**

1. A method of containing nuclear waste comprising:

(A) preparing a composition which comprises

(1) about 25 to about 80% calculated as SiO_2, of a compound having the general formula $SiR_m(OR')_nX_p$, $Si(OSiR_3)_4$, or mixtures thereof, partially hydrolyzed;

(2) up to about 30%, calculated as the metal oxide, of a compound having the general formula $AlR'_q(OR'')_rX_s$, $Mg(Al(OR)_4)_2$, $CaR_t(OR'')_uX_v$, or mixtures thereof, partially hydrolyzed if hydrolyzable;

(3) about 5 to about 20%, calculated as the metal oxide, of a compound having the general formula $BR'_q(OR)_rX_s$, $CaR_t(OR'')_uX_v$, or mixtures thereof, partially hydrolyzed;

(4) about 3 to about 25% calculated as the metal oxide, of a compound having the general formula MOR'', MZR'_3, or mixtures thereof, partially hydrolyzed if hydrolyzable, where the total calcium content, calculated a CaO, does not exceed 15%, and

where each R is independently selected from alkyl to C_{10} and alkenyl to C_{10}, and each R' is independently selected from R and aryl, each R'' is independently selected from R and hydrogen, each X is independently selected from chlorine and bromine, each M is independently selected from sodium, potassium, and lithium, each Z is independently selected from carbon and boron, m is 0 to 3, n is 0 to 4, p is 0 to 1, each q is independently selected from 0 to 3, each r is independently selected from 0 to 3, each s is independently selected from 0 to 1, each t is independently selected from 0 to 2, each u is independently selected from 0 to 2, each v is independently selected from 0 to 1, and $m+n+p=4$, $q+r+s=3$, and $t+u+v=2$,

(5) alcohol in a weight ratio to hydrolyzed alkoxide of about 0.5 to about 3, calculated as alkoxide; and

(6) sufficient water to remove at least 99% of said alkanol as an azeotrope;

(B) boiling off said azeotrope;

(C) mixing up to about 40%, based on solids in the product, calculated as oxide, of said nuclear waste into said composition;

(D) evaporating said mixture to about 25 to about 45% solids; and

(E) melting and cooling said mixture.

4,430,258

METHOD OF PRODUCING LIQUID EQUIVALENT SOLID GAMMA RAY CALIBRATION STANDARDS

Robert C. McFarland, and Patricia A. McFarland, both of 2392 Northside Pkwy., N.W., Atlanta, Ga. 30327

Filed May 28, 1981, Ser. No. 267,802
Int. Cl.³ G21G 4/04
U.S. Cl. 252—644 **14 Claims**

1. A method of producing solid gamma ray calibration standards, comprising the steps of:

(a) preparing a calibrated aqueous solution of radioactive material;

(b) adding a first volume of said calibrated aqueous solution of radioactive material to a second volume of a first solvent comprising an alcohol having less than 5 carbon atoms to form a first solution, and wherein said first volume is less than said second volume;

(c) dissolving an unsaturated polyester resin in styrene;

(d) mixing said resin dissolved in styrene with said first solution to form a mixture;

(e) adding a hardening catalyst to said mixture;

(f) stirring said mixture until a clear second solution is produced; and

(g) curing said second solution for a selected period of time.

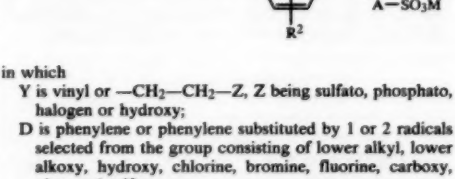
4,430,259

WATER-SOLUBLE DISAZO COMPOUNDS SUITABLE AS FIBER-REACTIVE DYESTUFFS

Peter Mischke, Bad Soden am Taunus; Hermann Fuchs, Königstein/Taunus, and Fritz Meininger, Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Nov. 4, 1981, Ser. No. 318,112
Claims priority, application Fed. Rep. of Germany, Nov. 6, 1980, 3041891; Oct. 6, 1981, 3139657
Int. Cl.³ C09B 62/513, 62/533; D06P 1/38, 3/10
U.S. Cl. 260—186 **6 Claims**

1. A water-soluble disazo compound of the formula



in which

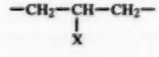
Y is vinyl or $—CH_2—CH_2—Z$, Z being sulfato, phosphato, halogen or hydroxy;

D is phenylene or phenylene substituted by 1 or 2 radicals selected from the group consisting of lower alkyl, lower alkoxy, hydroxy, chlorine, bromine, fluorine, carboxy, nitro and sulfo, or

D is naphthylene or naphthylene substituted by 1 or 2 radicals selected from the group consisting of lower alkyl, lower alkoxy, hydroxy, chlorine, bromine, fluorine, carboxy and sulfo;

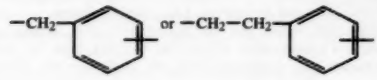
E is 1,4-phenylene or 1,4-naphthylene, or 1,4-phenylene or 1,4-naphthylene substituted by 1 or 2 radicals selected from the group consisting of lower alkyl, lower alkoxy, hydroxy, ureido, lower alkanoylamino, chlorine, bromine, carboxy and sulfo;

A is ethylene of the formula $—CH_2—CH_2—$, or ethyleneoxy of the formula $—CH_2—CH_2—O—$, or propylene of the formula $—CH_2—CH_2—CH_2—$, or is of the formula



wherein

X is hydroxy, lower alkanoylamino, halogen, sulfato or phosphato, or is



M is hydrogen, a metal or the equivalent of a metal;

R^1 is hydrogen, lower alkyl, lower alkenyl or lower alkyl substituted by hydroxy or phenyl or by both, or in alkyl of from 2 to 4 carbon atoms substituted by acetoxy, propionyloxy or phenylsulfonyloxy, or is cyanoalkyl of from 2 to 4 carbon atoms in the alkyl, or is carboxyalkylene, carbonamidoalkylene or carbalkoxyalkylene, the alkyl or aklylene moiety being in each case of from 1 to 4 carbon atoms or is halogenoethyl or a group of the formula —A—SO_3M, A and M being as defined above;

R^2 is hydrogen, lower alkyl, lower alkoxy, halogen, lower alkanoylamino, ureido or trifluoromethyl; and

R^3 is hydrogen, lower alkyl, lower alkoxy or halogen.

4,430,260

PENICILLIN-POLYVINYL ALCOHOL CONJUGATE AND PROCESS OF PREPARATION

Weng Y. Lee, 95 Rochester Pl., and Alec Sehon, 695 Academy Rd., both of Manitoba, Canada R3N OE8

Division of Ser. No. 15,864, Feb. 27, 1979, Pat. No. 4,296,097. This application Oct. 19, 1981, Ser. No. 312,890

Int. Cl.³ C07D *499/00*; A61K *31/43, 39/385*

U.S. Cl. 260—239.1 **7 Claims**

1. A process for the preparation of nonimmunogenic conjugates, suitable for suppressing the formation of reaginic antibodies to penicillin (BPO) in a host, the said conjugate being prepared by the reaction of penicillin G in the presence of a suitable salt, at alkaline pH, with an amino derivative of the water-soluble, nonimmunogenic polymer, polyvinyl alcohol (PVA).

6. A conjugate consisting of BPO groups coupled to polyvinyl alcohol, suitable for suppressing the formation of reaginic antibodies to penicillin in an allergic host, the conjugate containing an average of 0.7 to 3.9 BPO groups per molecule of polyvinyl alcohol, the said conjugate being prepared according to the process of claim 1.

4,430,261

PROPYLENE OXIDE REACTION PRODUCTS AND PROCESS FOR THEIR MANUFACTURE

Paul Schäfer, Riehen; Heinz Abel, Reinach, both of Switzerland, and Fritz Mayer, Weil am Rhein, Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 52,363, Jun. 27, 1979, abandoned, which is a division of Ser. No. 814,376, Jul. 8, 1977, abandoned, which is a division of Ser. No. 671,874, Mar. 29, 1976, Pat. No. 4,055,393. This application Mar. 19, 1981, Ser. No. 245,420

Claims priority, application Switzerland, Apr. 4, 1975, 4293/75

Int. Cl.³ C09F *5/00*

U.S. Cl. 260—404.8 **11 Claims**

1. A propylene oxide reaction product and a salt thereof obtained from an addition product of

(a) an at least trihydric aliphatic alcohol containing 3 to 10 carbon atoms, and

(b) 1,2-propylene oxide, by reaction with

(c) an aliphatic dicarboxylic acid containing 2 to 10 carbon atoms, an aromatic dicarboxilic acid containing 8 to 12 carbon atoms, or an anhydride thereof,

(d) an aliphatic diol with a molecular weight of at most 2000, and

(e) a fatty acid containing 12 to 22 carbon atoms.

4,430,262

PREPARATION OF ISOCYANATES AND/OR DERIVATIVES THEREOF

Rainer Engels, and Jan H. H. Meurs, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Mar. 11, 1982, Ser. No. 357,011

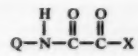
Claims priority, application United Kingdom, Jun. 5, 1981, 8117258

Int. Cl.³ C07C *118/00, 125/06, 127/19*

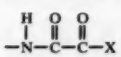
U.S. Cl. 260—453 P **11 Claims**

1. A process for the preparation of isocyanates and/or the corresponding carbamates containing at least one group having a structure selected from the group consisting of —N=C=O and

wherein A represents a group OB or NR^1R^2 wherein B represents an alkyl or aryl group which may or may not be substituted with one or more halogen atoms, alkyl or alkoxy groups and R^1 and R^2 which may be the same or different each represent a hydrogen atom or an alky or aryl group which may or may not be substituted with one or more halogen atoms, alkyl or alkoxy groups, which comprises oxidatively converting in a reaction zone as feed a compound selected from alkyl, aryl, alkaryl and aralkyl oxamic acids, salts thereof and oxanilides according to the general formula

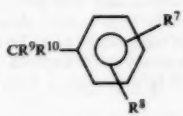


wherein Q represents a group selected from an alkyl group and an aryl group, which group may contain one or more substituents selected from a halogen atom or an alkyl or alkoxy group, a group

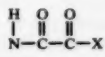


wherein X represents a group OY or

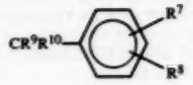
wherein Y represents a hydrogen atom, a metal ion or a group $NR^3R^4R^5R^6$ wherein each of R^3, R^4, R^5 and R^6 which may be the same or different, represent a hydrogen atom, an alkyl group having up to 8 carbon atoms, or an (alk)aryl group which may be substituted by one or more lower alkyl groups and Z represents an alkyl group or an aryl group which may be substituted by one or more substituents, or a group



wherein R^7 and R^8 which may be the same or different each represent a hydrogen or halogen atom or an alkyl or alkoxy group, a group



wherein X is as defined hereinbefore or a group



wherein R^9 and R^{10} which may be the same or different each represent a hydrogen atom or an alkyl group; and separating the conversion products from said reaction zone.

4,430,263

HAPTEN-INHIBITOR IMMUNOASSAY

Steven C. March, Libertyville; John W. Safford, Jr., Wauconda, and Susan E. Magic, Lake Bluff, all of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Continuation of Ser. No. 943,073, Sep. 18, 1978, abandoned. This application Jan. 21, 1980, Ser. No. 114,021

Int. Cl.[3] **G01N** *31/54;* **C12N** *9/99;* **C07G** *7/00*

U.S. Cl. 260—112 R **2 Claims**

1. Hapten-trypsin inhibitor conjugate having 1–3 molecules of hapten per molecule of trypsin inhibitor wherein the trypsin inhibitor is a protein trypsin inhibitor having a molecular weight range of 2,000–75,000.

4,430,264

PROCESS FOR THE PREPARATION OF A SELECTIVE ANOREXOGENIC SUBSTANCE REGULATING FOOD INTAKE

Jozsef Knoll, Budapest, and Janos Nagy, Szentendre, both of Hungary, assignors to Richter Gedeon Vegyeszeti Gyar Rt., Budapest, Hungary

Filed Sep. 28, 1982, Ser. No. 425,867

Claims priority, application Hungary, Sep. 28, 1981, 2783/81

Int. Cl.[3] **A23J** *1/06;* **A23K** *1/04;* **C07G** *7/00*

U.S. Cl. 260—112 R **3 Claims**

1. A process for producing an endogenous anorexogenic substance which comprises the steps of:

(a) ultrafiltering, through a 50,000 dalton threshold membrane, blood serum to recover an ultrafiltrate, partially evaporating said ultrafiltrate to form a first concentrate, and removing insolubles from said first concentrate;

(b) precipitating proteins from the first concentrate following step (a) by treating it with trichloroacetic acid in an amount of substantially 5 to 25% w/v at a temperature of substantially 0° to 10° C., and separating precipitated proteins from the resulting solution;

(c) chromatographing said solution on a gel having a void volume under substantially 4000 dalton with a solution of substantially 0.5 to 1.0% sodium chloride of phosphate buffer at a pH of substantially 6.0 to 7.0 to recover anorexogenically biologically active fractions, and concentrating said fractions by lyophilization to form a second concentrate;

(d) chromatographing said second concentrate upon a gel column with a void volume of substantially 3000 dalton to recover anorexogenically biologically active fractions;

(e) lyophilizing the biologically active fractions of step (d) to yield a crude product forming said substance; and

(f) subjecting the crude product of step (e) to electrophoresis in a buffer of substantially pH 6.0 to 6.5, eluting the electrophoresed product, and lyophilizing the eluted electrophoresed product to form said substance in a semipure state.

4,430,265

GLUCOSAMINE DERIVATIVES

Yuichi Yamamura, Takarazuka; Azuma Ichiro, Suita, and Shigeru Kobayashi, Hirakata, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 249,902, Apr. 1, 1981, abandoned, which is a continuation of Ser. No. 962,033, Nov. 20, 1978, abandoned. This application Jun. 30, 1982, Ser. No. 393,870

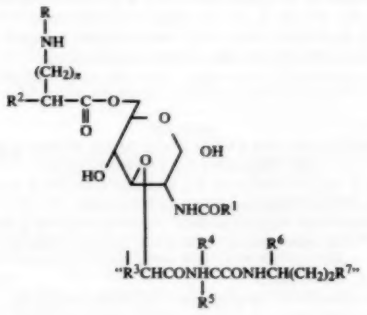
Claims priority, application Japan, Dec. 2, 1977, 52-145415; Dec. 2, 1977, 52-145416; Mar. 10, 1978, 53-28012

The portion of the term of this patent subsequent to Jan. 18, 2000, has been disclaimed.

Int. Cl.[3] **C07C** *103/52*

U.S. Cl. 260—112.5 R **14 Claims**

1. A compound of the following formula or a physiologically acceptable salt thereof:



wherein

n is zero or an integer of 1 to 9;

R^1 is lower alkyl;

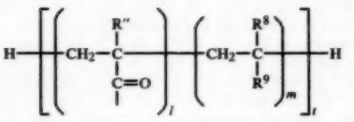
R^2 is hydrogen or lower alkyl when n is zero, and hydrogen or amino when n is an integer of 1 to 9;

R^3 is lower alkyl;

R^4 and R^5, independently of each other, are hydrogen, lower alkyl or hydroxymethyl;

R^6 and R^7, independently of each other, are a carboxyl group which may be amidated;

R is hydrogen or a group of the formula R'CO— wherein R' is an acyclic hydrocarbon group which may be substituted by a cyclic hydrocarbon group at its ω-position or a group of the formula



wherein

l is an integer of 1 to 9;

m is zero or an integer of 1 to 9;

t is an integer of 2 to 100;

R'' is hydrogen or lower alkyl;

R^8 is hydrogen or lower alkyl;

R^9 is lower alkyl, a carboxyl group which may be esterified, a hydroxyl group which may be etherified or a pyrrolidino group which may be substituted by oxo, halogen, lower alkyl, nitro, amino or cyano;

l and m are variable within the said respective ranges and R^8 and R^9 are variable within the said definition, in the respective repeating units.

4,430,266

PROCESS FOR PRODUCING AN INSULIN PRECURSOR

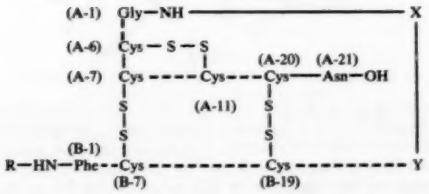
Bruce H. Frank, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Continuation of Ser. No. 210,696, Nov. 28, 1980, abandoned, which is a continuation-in-part of Ser. No. 134,389, Mar. 27, 1980, abandoned. This application Feb. 16, 1982, Ser. No. 349,397

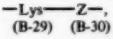
Int. Cl.³ C07C *103/52*; C07G *7/00*

U.S. Cl. 260—112.7 17 Claims

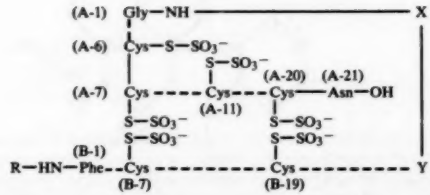
1. A process for the production of an insulin precursor of the formula



in which R is hydrogen, a chemically or enzymatically cleavable amino acid residue, or a chemically or enzymatically cleavable peptide moiety having at least two amino acid residues, Y is



in which Z is Ala, Thr, or Ser; the moiety from A-1 to A-21 is an insulin A-chain; the moiety from B-1 to B-30 is an insulin B-chain; and X is a moiety which is joined to the insulin A-chain at the amino group of A-1 and to the insulin B-chain at the ϵ-amino group of B-29 or the carboxyl group of B-30, which moiety can be enzymatically or chemically cleaved from and without disruption of both the A-chain and the B-chain, which comprises reacting an S-sulfonate of the formula



in which R, X, and Y are as aforedefined, with a mercaptan in an amount which provides from about 1 to about 5 —SH moieties per each $—SSO_3^-$ moiety in an aqueous medium at a pH of from about 7 to about 11.5 and at an S-sulfonate concentration of up to about 10 mg. per ml. of aqueous medium.

4,430,267

METAL COMPLEX DYES DERIVED FROM 4-PHENYLAZO-5-AMINOPYRAZOLES

Johannes Dehnert, Ludwigshafen, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Rheinland-Pfalz, Fed. Rep. of Germany

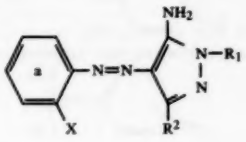
Filed Feb. 23, 1981, Ser. No. 237,274

Claims priority, application Fed. Rep. of Germany, Mar. 1, 1980, 3007966

Int. Cl.³ C09B *29/036, 29/46*; D06P *1/10, 3/52*

U.S. Cl. 260—147 6 Claims

1. A nickel complex obtained by heating one or more compounds of the formula



where

R_1 is cyclohexyl, methylcyclohexyl, phenyl C_1–C_4-alkyl, said phenyl being unsubstituted or substituted by chloro, methyl or is furylmethyl;

R_2 is hydrogen;

X is fluorine, chlorine, bromine or phenoxy, and the ring a is further unsubstituted or is further substituted by fluorine, chlorine, bromine, trifluoromethyl, C_1–C_4 alkyl, chlorophenoxy, methylphenoxy, cyano, nitro, C_1-to-C_4-alkylsulfonyl, phenylsulfonyl, C_1-to-C_{10}-alkoxycarbonyl, carbamyl, sulfamyl, phthaloyl, phenylazo or phenylazo substituted by fluorine, chlorine, bromine, methyl, ethyl, cyano, nitro or C_1–C_{10}-alkoxy carbonyl, in an organic solvent in the presence of an acid acceptor and of a nickel compound.

4,430,268

ALLYLIC CHLORINATION PROCESS

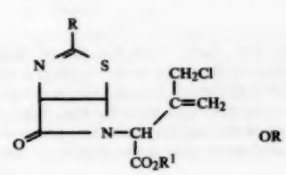
Robin D. G. Cooper, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

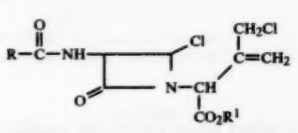
Continuation-in-part of Ser. No. 34,825, Apr. 30, 1979, abandoned. This application Mar. 17, 1980, Ser. No. 130,888

Int. Cl.³ C07D *205/08, 513/14*; C07B *9/00*

U.S. Cl. 260—239 A 12 Claims

1. A process for preparing a compound of the formula





wherein

R is hydrogen,

methoxy,

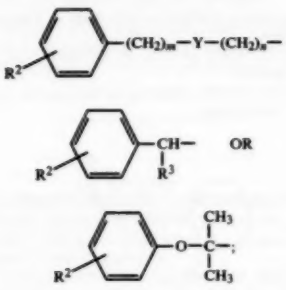
C_1–C_2 alkoxycarbonyl,

C_1–C_8 alkyl

C_1–C_8 alkyl monosubstituted with protected hydroxy, C_1–C_3 alkoxy or cyano,

C_2–C_8 alkenyl,

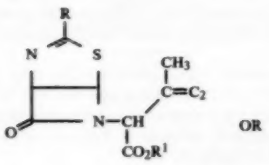
C_2–C_8 alkenyl monosubstituted with protected hydroxy, C_1–C_3 alkoxy or cyano,
C_3–C_8 cycloalkyl,
C_3–C_8 cycloalkyl substituted with protected hydroxy, C_1–C_3 alkoxy or cyano,



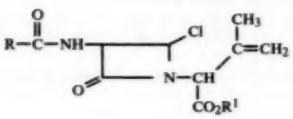
OR

OR

R^2 is hydrogen, protected hydroxy, chloro, bromo, C_1–C_3 alkyl, C_1–C_3 alkoxy, nitro or cyano;
Y is oxygen or a carbon-carbon bond;
R^3 is protected hydroxy, C_1–C_4 alkyl or protected amino;
m is 0–2;
n is 0–2;
R^1 is a carboxylic acid protecting group; provided that the 1- and 5-position C—H bonds in the resulting thiazolinoazetidinone are in the α-position; comprising reacting a compound of the formula



OR



wherein the 1-and 5-position C—H bonds in the thiazolinoazetidinone are in the α-position, with molecular chlorine or t-butyl hypochlorite in the presence of a C_1–C_3 carboxylic acid; provided that, when the starting compound is a thiazolinoazetidinone, and molecular chlorine is used, an epoxide is also present.

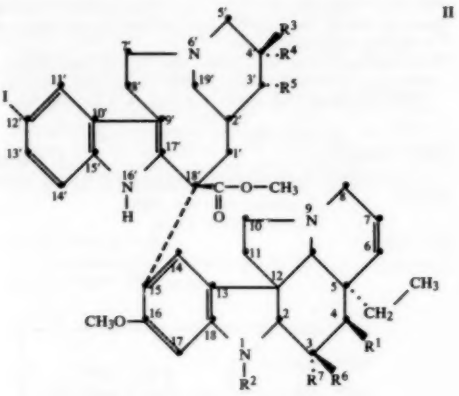
4,430,269

12'-IODO DERIVATIVES OF DIMERIC INDOLE-DIHYDROINDOLE ALKALOIDS, AND PROCESS FOR PREPARING THEM

Homer L. Pearce, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Apr. 1, 1982, Ser. No. 364,384
Int. Cl.³ C07D *519/04, 471/22*
U.S. Cl. 260—244.4 **6 Claims**

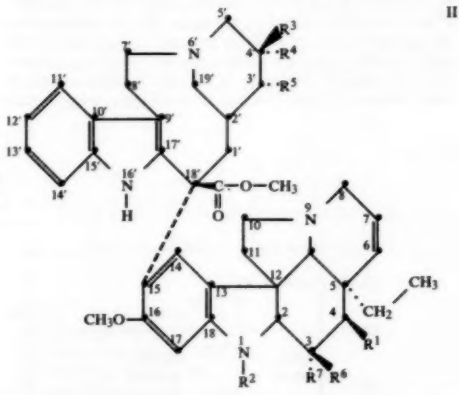
1. A compound of the formula



wherein R^1 is H, OH, O—CO—CH_3, or O—CO—CH_2R^8, wherein R^8 is Cl, morpholino, dimethylamino, cyclopropylmethylamino and methylamino, R^2 is H, CH_3 or CHO; when R^3 and R^5 are taken singly, R^5 is H or OH, one of R^3 and R^4 is ethyl and the other is H or OH; when R^3 and R^5 are taken together with the carbons to which they are attached, they form an oxirane ring or a vinyl group, in either of which cases, R^4 is ethyl; when taken singly, R^6 is OH and R^7 is CO—OCH_3 or CO—R^9, wherein R^9 is NH_2, NH_2—NH_2, NH—C_{1-3} alkyl, NH-substituted-C_{1-3}-alkyl (wherein said substituents can be one or two members of the group chloro and bromo), or C_{1-3} lower-alkanoyloxy; when R^6 and R^7 are taken together with the carbon atoms to which they are attached, they represent a spiro-oxazolidinedione ring permissibly substituted at N_3" with C_{1-3} alkyl or chloro-substituted C_{1-3}alkyl; and pharmaceutically acceptable acid addition salts thereof formed with relatively non-toxic acids.

3. 12-iodocatharanthine.

4. The process of preparing a compound according to claim 1 which comprises reacting a compound of the structure



wherein R^1 is H, OH, O—CO—CH_3, or O—CO—CH_2R^8, wherein R^8 is Cl, morpholino, dimethylamino, cyclopropylmethylamino and methylamino, R^2 is H, CH_3 or CHO; when R^3 and R^5 are taken singly, R^5 is H or OH, one of R^3 and R^4 is ethyl and the other is H or OH; when R^3 and R^5 are taken together with the carbons to which they are attached, they form an oxirane ring or a vinyl group, in either of which cases,

R^4 is ethyl; when taken singly, R^6 is OH and R^7 is CO—OCH_3 or CO—R^9, wherein R^9 is NH_2, NH_2—NH_2, NH—C_{1-3} alkyl, NH-substituted-C_{1-3}-alkyl (wherein said substituents can be one or two members of the group chloro and bromo), or C_{1-3} lower-alkanoyloxy; when R^6 and R^7 are taken together with the carbon atoms to which they are attached, they represent a spiro-oxazolidinedione ring permissibly substituted at N_3'' with C_{1-3} alkyl or chloro-substituted C_{1-3}-alkyl, or an acid addition salt thereof, with a reagent containing a soluble ferrous salt, a soluble periodate salt, RuO_2, acetic acid and an inert polar organic solvent.

4,430,270

PROCESS FOR THE PRODUCTION OF DELTA 4-C21-STEROID COMPOUNDS

Wolfgang Preuss, Monheim, Fed. Rep. of Germany, assignor to Henkel Kommanditgesellschaft auf Aktien, Dusseldorf-Holthausen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 262,967, May 12, 1981, abandoned. This application Aug. 13, 1982, Ser. No. 407,791

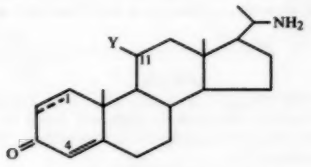
Claims priority, application Austria, May 12, 1980, 2536/80; May 16, 1980, 2630/80

Int. Cl.³ C07J *1/00*

U.S. Cl. 260—397.1 **21 Claims**

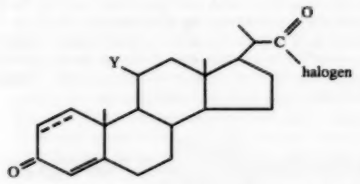
1. A process for the production of Δ4-C21-steroid compounds with an amine in the 20-position corresponding to general formula I:

(I)



in which Y is a member selected from the group consisting of hydrogen, hydroxyl, and together with the C-atom substituted by Y, a carbonyl and a 9(11)-ene bond characterized in that a C20-carboxylic acid halide corresponding to general formula II:

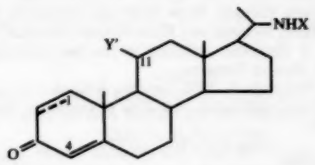
(II)



in which Y is defined above, is reacted with a metal azide in an aqueous/organic two-phase reaction at a temperature of below about 25° C., the resulting carboxylic acid azide is recovered and heated to give the corresponding C20-isocyanate by the elimination of nitrogen and the corresponding C20-isocyanate thus obtained is coverted into the C20-amine, and recovering said Δ4-C21-steroid compounds.

4. C21-steroid compounds with an oxygen function in the 11-position and a nitrogen function in the 20-position corresponding to general formula IV:

(IV)



in which Y' is a member selected from the group consisting of hydroxyl and, together with the C-atom substituted by Y', a carbonyl and X is a member selected from the group consisting of hydrogen, acetyl, carbonyloxy-lower alkyl and, together with the adjacent hydrogen atom on the nitrogen, a carbonyl.

4,430,271

ENERGY TRANSFER

Brandon H. Barton, 3712 Ledgewood, Cincinnati, Ohio 45207, and John A. Sagel, 10536 Gloria Ave., Mt. Healthy, Ohio 45231

Filed Jul. 1, 1976, Ser. No. 701,729

Int. Cl.³ C07C *141/02, 143/24*

U.S. Cl. 260—458 R **26 Claims**

1. In the process of removing thermal energy from an aqueous mixture of sodium sulfate and the sodium salt of an organic sulfuric or sulfonic acid or mixtures thereof the steps of:

(a) reacting the organic sulfuric or sulfonic acid and excess sulfating agent with an alkaline component thereby forming a super-saturated solution with respect to the sodium sulfate; and,

(b) cooling the reaction mass formed in step (a) in a heat exchanger while maintaining the heat exchanger cooling medium at a temperature below the point at which anhydrous sodium sulfate is formed,

whereby deposition of sodium sulfate in the heat exchanger is diminished.

4,430,272

FLUORINE-CONTAINING ALKYLSULFOBETAINES, A PROCESS FOR THEIR PREPARATION AND THEIR USE

Winfried Ehrl, Neuötting, and Siegfried Jung, Karben, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

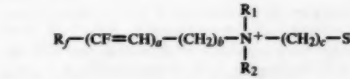
Filed Feb. 9, 1982, Ser. No. 347,178

Claims priority, application Fed. Rep. of Germany, Feb. 11, 1981, 3104766

Int. Cl.³ C07C *143/14*

U.S. Cl. 260—501.12 **1 Claim**

1. A fluorine-containing alkylsulfobetaine of the general formula



wherein R_f denotes a perfluoroalkyl radical having 3 to 16 C atoms, R_1 and R_2, which can be identical or different, denote alkyl radicals or hydroxyalkyl radicals having 1 to 4 C atoms, a is zero or 1, b assumes the value 1 when a is equal to 1 and the values 1 to 4 when a is equal to 0, and c is 3 or 4.

4,430,273

PRODUCTION OF ACETIC ANHYDRIDE

Heinz Erpenbach, Cologne; Klaus Gehrmann, Erftstadt; Hans-Klaus Kübbeler, Swisttal, and Klaus Schmitt, Erftstadt, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Apr. 7, 1982, Ser. No. 366,344

Claims priority, application Fed. Rep. of Germany, Aug. 17, 1978, 2836084

Int. Cl.³ C07C *51/12*

U.S. Cl. 260—546 7 Claims

1. A process for making acetic anhydride by reacting at least one substance selected from methyl acetate and dimethylether with carbon monoxide under substantially anhydrous conditions, at temperatures of 350 to 575 K. and under pressures of 1 to 300 bars in the presence of a catalyst system comprised of noble metals belonging to group VIII of the periodic system of the elements or their compounds and at least one substance selected from iodine and its compounds, which comprises using a promoter system consisting essentially of an aliphatic carboxylic acid with 1 to 8 carbon atoms and at least one heterocyclic aromatic compound, in which at least one hetero atom is a quaternary nitrogen atom.

4,430,274

CARBURETOR AND METHOD FOR AN INTERNAL COMBUSTION ENGINE

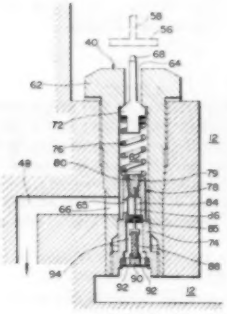
Mikio Suzuki, Zushi, and Masafumi Yamazaki, Yokosuka, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Feb. 8, 1982, Ser. No. 346,743

Claims priority, application Japan, Feb. 9, 1981, 56-17866

Int. Cl.³ F02M *25/14*

U.S. Cl. 261—18 B 16 Claims



1. A method of operating an internal combustion engine capable of running on gasoline and on a fuel mixture of gasoline and alcohol, comprising the steps of:

(a) determining the proportion of alcohol in the fuel currently used by the engine, using a material which expands and contracts in accordance with the proportion of alcohol;

(b) adjusting the amount of fuel supplied to the engine in accordance with said determined proportion; and

(c) adjusting the timing of fuel supplied to the engine in accordance with said determined proportion.

4,430,275

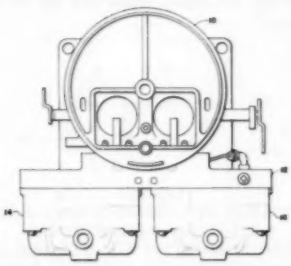
DUAL BOWL METERING BLOCK FOR ALCOHOL AND/OR NITRO-METHANE BURNING CARBURETOR AND METHOD OF CONVERSION

Johnnie A. Horton, Tulsa, Okla., assignor to Leroy Penrod; John A. Stutsman, both of Tulsa, Okla., part interest to each

Filed Aug. 13, 1982, Ser. No. 407,709

Int. Cl.³ F02M *11/02*

U.S. Cl. 261—18 B 5 Claims



1. In a carburetor having at least one removable fuel bowl and metering block the specific improvement comprising: a carburetor metering block means adapted to attach to said carburetor and replace said removable fuel bowl and metering block and said carburetor metering block means is further characterized in that it is adapted to accept, simultaneously, a plurality of individual and separate fuel bowls.

4. A method of converting a gasoline fueled carburetor to alcohol and/or nitro-methane fuel comprising the step of: replacing the carburetor metering block with a carburetor metering block means adapted to attach to said carburetor and accept, simultaneously, a plurality of individual and separate fuel bowls.

4,430,276

METHOD OF MAKING STABLE UO_2 FUEL PELLETS

Kenneth C. Radford, Churchill Borough, and James M. Pope, Monroeville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 2, 1981, Ser. No. 308,316

Int. Cl.³ G21C *21/00*

U.S. Cl. 264—0.5 13 Claims

1. In a method where a UO_2 powder which is sinterable to at least 97% theoretical density at 1600° C. in H_2 in one hour is produced from an aqueous solution of UO_2F_2, an improvement which enhances the dimensional stability of a fuel pellet made from UO_2 powder, comprising adding a water soluble dopant forming compound containing an element selected from the group consisting of aluminum, calcium, magnesium, titanium, zirconium, vanadium, niobium, and mixtures thereof, to said solution in an amount such that said UO_2 powder contains about 0.05 to about 1.7 mole% of said dopant.

4,430,277

METHOD FOR PRODUCING LARGE DIAMETER SPUN FILAMENTS

Leroy C. Lin, Richmond, Va., assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 714,866, Aug. 16, 1976, Pat. No. 4,316,716. This application May 22, 1978, Ser. No. 908,028

Int. Cl.³ D01D *5/10*

U.S. Cl. 264—22 2 Claims

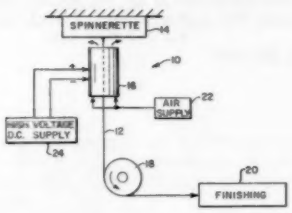
1. A method of producing large diameter polymer filaments comprising the steps of:

(A) heating a polymer to a molten state;

(B) forcing the molten polymer through a spinnerette orifice to form a continuous length filament;

(C) directing two streams of cooling air in the vicinity of the orifice in a cross-flow pattern toward each other and said filament and transverse to the axis of the orifice;

(D) directing a balanced high-voltage, low-amperage ionic discharge from a plurality of cathode and electrode pairs



arranged radially symmetrically around the filament with the cathode and anode of each pair being diametrically opposed, said discharge occurring in the presence of the cooling air and transverse to the orifice axis; and

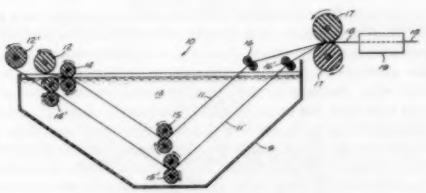
(E) drawing the polymer filament at a constant take-up speed through the cooling air and ionic discharge.

4,430,278

PROCESS FOR INCREASING THE PERMEABILITY OF PLASTIC MEMBRANE

John L. Jones, Sr., 1070 Glen Oaks Blvd., Pasadena, Calif. 91105

Filed Feb. 1, 1982, Ser. No. 344,293
Int. Cl.³ B29D *27/00*
U.S. Cl. 264—22 **12 Claims**



1. A process useful in increasing the permeability of a thermoplastic composition membrane to waste excreta molecules of human urine, comprising:

forming a thick wall, small diameter tube by extruding a thermoplastic composition, free of plasticizer, through a tubing die, disposing said tube in a water solution bath having a controlled temperature above room temperature, said water solution bath containing waste excreta crystalline molecules found in human urine,

continuously injecting said controlled temperature water solution from said water bath into said tubing die and then into the plastic tubing interior at a water solution volume flow rate cooperating with the plastic tubing formation rate, causing tubing expansion into a thin wall membrane having a wall thickness not more than 0.005 cm, as the membrane tubing remains immersed in said water solution bath, said membrane tubing expansion being controlled to provide a selected outside stretched tubing membrane diameter,

maintaining the stretched membrane in said controlled temperature water solution bath for a controlled time period, providing saturation of the membrane,

removing said stretched membrane from said water bath and removing excess surface water from said stretched membrane, and,

irradiating said stretched membrane with microwave energy of the frequencies absorbed by water molecules in said stretched membrane, providing a more microporous membrane with increased permeability to waste excreta human urine chemical molecules found in human urine.

4,430,279

PROCESS FOR PRODUCING ZIRCONIA YTTRIA GRINDING MEDIA USED FOR GRINDING MAGNETIC COATING POWDER

Takehiko Hagio, Dazaifu, and Michito Miyahara, Fukuoka, both of Japan, assignors to Nippon Tungsten Co., Ltd., Fukuoka, Japan

Division of Ser. No. 412,297, Aug. 27, 1982, abandoned. This application May 18, 1983, Ser. No. 495,816
Claims priority, application Japan, Aug. 28, 1981, 56-135765
Int. Cl.³ C04B *35/48*
U.S. Cl. 264—65 **2 Claims**

1. A process for producing zirconia grinding media used for grinding a magnetic coating powder having an improved packing density comprising:

(a) preparing primary particle powder of zironium oxide, said primary particle having monoclinic crystal structure and tetragonal crystal structure which includes about 3.6 to 8.0 percent by weight of yttrium oxide as dispersed solid solution, said primary particle powder having the mean grain size of less than 0.5 micron,

(b) compacting said primary particle powder at a pressure of more than 500 kg/square centimeter into a green compact, and

(c) sintering said green compact in the air or an inert gas atmosphere at a temperature of about 1400° C. to 1800° C. to obtain thereby a sintered body having a mean grain size of up to about 2 microns and a relative theoretical density of at least 98 percent.

4,430,280

PROCESS FOR THE PRODUCTION OF MIXED GRANULATE FROM CARBON BLACK AND LIGHT FILLER

Alfons Kreher, Frankfurt; Gerhard Kühner, Hanau; Lothar Rothbühr, Hürth; Günter Türk, Hanau, and Siegfried Wolff, Bornheim-Merten, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Mar. 18, 1980, Ser. No. 131,533
Claims priority, application Fed. Rep. of Germany, Mar. 21, 1979, 2910991
Int. Cl.³ B01J *2/00*
U.S. Cl. 264—117 **5 Claims**

1. In a process for the production of mixed granulates of carbon black and a light colored filler selected from the group consisting of silica, kaolinite, clay, silica chalk, chalk, natural zeolite, sodalite, synthetic zeolite, calcium silicate, aluminum silicate, and magnesium silicate by means of a pin containing screw granulator, the improvement comprising continuously supplying carbon black to the granulator and continuously spraying the light colored filler in the form of an aqueous dispersion on the carbon black in the granulator, simultaneously granulating this mixture and drying the granulated mixture so obtained.

4,430,281

PROCESS FOR PELLETIZING LIMESTONE FINES

David R. Boylan, and Mansur U. Huq, both of Ames, Iowa, assignors to Iowa Limestone Company, Des Moines, Iowa

Filed Aug. 30, 1982, Ser. No. 412,587
Int. Cl.³ B28B *1/08*
U.S. Cl. 264—118 **8 Claims**

1. A process for pelletizing limestone fines in substantially uniformly sized pellets having controlled liquid dispension and low-powdering characteristics, comprising.

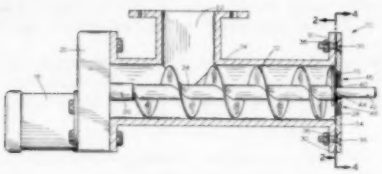
(a) intimately mixing in dry form of approximately 94% to

98% limestone fines with approximately 2% to 6% sodium bentonite by weight,

(b) adding approximately 15% to approximately 25% water by weight to the dry mix,

(c) mixing the water and the dry mix into a cohesive plastic state,

(d) forming a die plate with orifices therethrough each of which has a diameter equal to approximately one-eighth the thickness of the die plate,



(e) producing a zone for compacting the plastic mix as it enters each orifice,

(f) extruding the plastic mix through the die plate orifices at a pressure of less than about 10 pounds per square inch to produce an extrudite mix, and

(g) subjecting the extrudite mix adjacent the outlet of each orifice to a zone for producing and then relieving longitudinal stresses therein to form microstructure cracks in the surface of the extruded product.

4,430,282

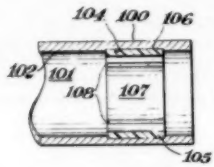
METHOD FOR THE EXTRUSION OF TETRAFLUOROETHYLENE POLYMER TUBES

Eugene V. Stack, Bay City, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed May 17, 1982, Ser. No. 378,673

Int. Cl.³ B29D *23/04*

U.S. Cl. 264—127 **2 Claims**



1. A method for the fabrication of tetrafluoroethylene polymer tubes wherein a tetrafluoroethylene polymer resin is ram extruded in a ram extruder to generally fuse together particles of the tetrafluoroethylene polymer resin to provide a coherent tetrafluoroethylene polymer tube discharging the coherent tetrafluoroethylene polymer tube from the ram extruder, the ram extruder having a hollow cylindrical barrel, the barrel having a resin entrance end and a resin exit end, a hollow cylindrical ram reciprocally movable to a location within and external to the entrance end of the barrel, a generally cylindrical mandrel disposed within and passing through the hollow cylindrical ram, the mandrel extending into the barrel and terminating generally adjacent the discharge end of the barrel, the ram being in operative association with means to reciprocally position the hollow cylindrical ram generally along an axis of the direction of extrusion of the barrel and means to reciprocally position the mandrel along the axis of extrusion of the barrel, the improvement which comprises disposing a generally hollow cylindrical spacer between the hollow cylindrical ram and the mandrel at a location generally adjacent the entrance end of the barrel.

4,430,283

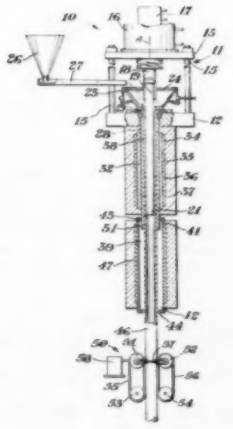
METHOD FOR THE EXTRUSION OF TETRAFLUOROETHYLENE POLYMER TUBES

Edward L. Burnett, and Eugene V. Stack, both of Bay City, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 206,212, Nov. 13, 1980, abandoned. This application May 17, 1982, Ser. No. 378,963

Int. Cl.³ B27J *5/00*

U.S. Cl. 264—127 **3 Claims**



1. In a method for the fabrication of a tetrafluoroethylene article wherein tetrafluoroethylene polymer resins in the form of polytetrafluoroethylene particles are ram extruded in a ram extruder to generally fuse together the polytetrafluoroethylene particles at a temperature above the crystalline melting point of the particles to provide a coherent tetrafluoroethylene polymer tube, discharging the coherent tetrafluoroethylene polymer tube from the extruder and subsequently cooling the tetrafluoroethylene polymer tube to a self supporting condition, the improvement which comprises discharging the tetrafluoroethylene polymer tube from the extruder at a temperature above its crystalline melting point, cooling the tube below its crystalline melting point while the tube is radially unsupported and axially supported, thereby providing a tetrafluoroethylene polymer tube of reduced tendency to shrink in radial and axial directions, and having a desirable resistance to permeation of gases therethrough.

4,430,284

METHOD OF COEXTRUDING MECHANICALLY INTERCONNECTED MULTI-LAYER LAMINATES WITH MECANICAL LAYER INTERCONNECTION

Ole-Bendt Rasmussen, Topstykket 7, 3460 Birkerod, Denmark

Division of Ser. No. 926,244, Jul. 20, 1978, Pat. No. 4,229,394, which is a division of Ser. No. 607,695, Aug. 25, 1975, Pat. No. 4,125,581, which is a continuation of Ser. No. 421,270, Dec. 3, 1973, abandoned, which is a continuation of Ser. No. 75,229, Sep. 24, 1970, abandoned, which is a continuation-in-part of Ser. No. 871,688, Nov. 19, 1969, abandoned, which is a continuation of Ser. No. 694,433, Dec. 29, 1967, abandoned, and Ser. No. 694,660, Dec. 29, 1967, Pat. No. 3,547,761, and Ser. No. 751,205, Aug. 8, 1968, abandoned, and Ser. No. 751,237, Aug. 8, 1968, abandoned. This application May 30, 1980, Ser. No. 154,769

Claims priority, application United Kingdom, Dec. 30, 1966, 58429/66; Aug. 9, 1967, 36531/67

Int. Cl.³ B29D *7/02*; B29F *3/10*

U.S. Cl. 264—171 **13 Claims**

1. A method of forming a laminate of at least two plys which comprises the steps of co-extruding at least two layers of at

least one polymeric material in face-to-face contact with each such contacting layer face having at generally regular intervals thereacross toothlike projections projecting generally outwardly of the plane of such layer in embedded relation into the

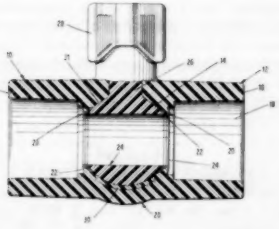
adjacent layer to provide an improved surface interconnection between each adjacent pair of layers thereof, said toothlike projections in adjacent layer faces extending generally parallel along the laminate.

4,430,285

METHOD AND APPARATUS FOR PREVENTING THERMAL DAMAGE TO A PREFORMED PLUG DURING MOLDING OF A HOUSING THEREAROUND

Gary L. Runyan, and Paul H. Sloan, Jr., both of Louisville, Ky., assignors to Nibco Inc., Elkhart, Ind.

Filed Oct. 23, 1981, Ser. No. 314,271
Int. Cl.[3] B29C 6/02
U.S. Cl. 264—242 21 Claims



1. A method of forming a rotary plug valve of the type comprising a housing formed of a polymer and a rotary plug disposed in a through-passage of said housing;

providing a rotary plug having a bore extending diametrically therethrough and formed of a polymer;

forming a shell-like shield of a resilient polymeric material of a shape to closedly seat against and cover a portion of the peripheral surface of the plug, attaching the shield by snap-fitting said shield onto said plug with its inner surface conforming to the peripheral surface of said plug;

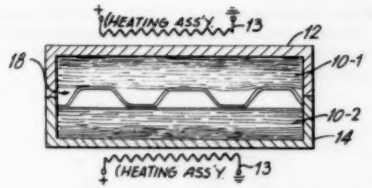
positioning said plug and shield assembly within a cavity of a mold on a mold core means for supporting said assembly and forming the through-passage, said cavity corresponding to the shape of said housing, and introducing a molten polymer into said cavity at a point whereat the shield is interposed between the polymer and the plug to shield the plug from the thermal energy of the molten polymer as the polymer is initially introduced into the cavity and to form said housing around said plug and bond said shield to the housing formed by the polymer.

4,430,286

VARIABLE DENSITY BOARD HAVING IMPROVED THERMAL AND ACOUSTICAL PROPERTIES AND METHOD AND APPARATUS FOR PRODUCING SAME

Edward W. Franz, Colts Neck, N.J., assignor to Celotex Corporation, Tampa, Fla.

Filed Jul. 14, 1980, Ser. No. 167,800
Int. Cl.[3] B29D 3/02; B29C 11/00
U.S. Cl. 264—258 10 Claims



1. A method for producing as a porous molded end product, a member adapted to serve as a thermal and/or acoustic barrier and having improved thermal and/or acoustic properties comprising the steps of:

compressing a plurality of porous resilient compressible blankets of loosely gathered fibers treated with an uncured binder within a closed mold having a shape conforming to the desired configuration of the molded end product;

interposing a collapsible medium formed of thermoplastic material and having a predetermined thickness between adjacent ones of said blankets, said medium occupying a predetermined region of said mold whereby said mold compresses a major portion of said blankets by a substantial amount and only slightly compresses an associated portion of said medium;

heating said mold to develop a varying temperature profile across the interior of said mold to thereby heat said blankets and said medium, the temperature level in the region of said medium being such that said medium initially softens and contracts significantly and ultimately disperses into the interstices of said blankets while the binder adjacent to the region of said medium is uncured allowing adjacent uncured resilient portions of said compressed blankets to correspondingly expand into the region previously occupied by the contracting medium while portions of said blankets remote from said medium are being cured, said uncured binder ultimately being cured to thereby create a porous end product which gradually decreases in density from both major surfaces toward the center thereof.

4,430,287

REACTION INJECTION MOLDING OF NYLON

Peter J. Tilgner, Akron, Ohio, assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Jul. 21, 1982, Ser. No. 400,338
Int. Cl.[3] B29F 1/08; B29G 3/00
U.S. Cl. 264—40.6 8 Claims

1. The method of molding polymeric materials by the reaction injection mixing (RIM) process of combining two or more chemically reactive polymer components in a mixing head immediately prior to introducing the combined components into a mold, comprising the steps of:

A. providing RIM equipment comprising;

(1) a RIM mixing head;

(2) a supply tank, feed pump, volumetric metering and pressurizing means, and supply and recycle ducting interconnecting said tank, pump and metering means with said metering head for each reactive component employed in the RIM process, establishing separate flow paths for each

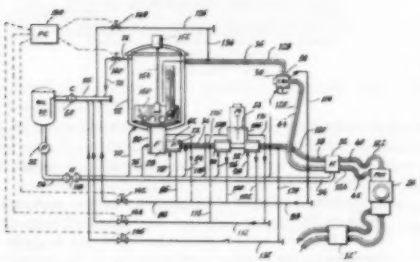
of said reactive components to and from said mixing head; and

(3) an attempering fluid system in heat-exchange but non-flow communication with each of said reactive component flow paths, said attempering system comprising for each reactive component flow path:

(a) an attempering fluid reservoir, a circulating pump, a supply manifold fed by said pump, a return manifold connected to said reservoir for return of attempering fluid thereto;

(b) heat exchange means in at least one of said manifolds for regulating the temperature of said attempering fluid;

(c) casings and jackets enclosing all portions of the reactive component flow path;



(d) a supply duct system connecting said casings and jackets to said supply manifold for feeding attempering fluid to said casings and jackets and forming multiple zones along the reactive component flow path;

(e) a return duct system connecting said casings and jackets to said return manifold; and

(f) variable flow restrictor means in at least one of said duct systems;

B. selectively varying the attempering fluid flow in a selected zone differently from that in other zones along the flow path of the reactive component by controlling the settings of said flow restrictor means.

4,430,288

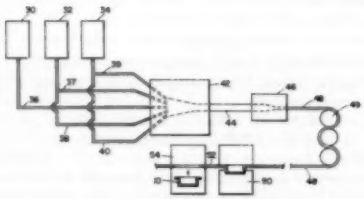
MAKING COEXTRUDED SHEETS AND CONTAINERS

Laszlo J. Bonis, Swampscott, Mass., assignor to Composite Container Corporation, Medford, Mass.

Filed Dec. 18, 1981, Ser. No. 331,911

Int. Cl.³ B29C *17/02*

U.S. Cl. 264—510 **6 Claims**



1. A method of making a multilayered structure, said method comprising

coextruding by

separately heating a polyolefin having moisture barrier properties and a specific gravity greater than 0.9 and polyester,

supplying said heated polyolefin and polyester to a coextrusion block to form a multilayer stream with

a layer of said polyolefin having moisture barrier properties and a specific gravity greater than 0.9, and

a layer of said polyester, and

flattening said multilayer stream in a coextrusion die to produce a multilayer sheet having a width greater than the width of said multilayer stream, a thickness less than the height of said multilayer stream, a polyester layer and a polyolefin layer,

said polyester layer providing chemical resistance, mircowave heatability and thermoformability during manufacture,

said sheet having consistent and reliable bonds between layers owing to its having been coextruded.

4,430,289

PROCESS FOR REDUCING BLOCK AND INCREASING SLIP OF LINEAR LOW DENSITY POLYETHYLENE COPOLYMER EXTRUSION-BLOWN FILMS

Osborne K. McKinney, and David P. Flores, both of Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 256,268, Apr. 21, 1981, Pat. No. 4,394,474. This application Apr. 5, 1982, Ser. No. 365,431

Int. Cl.³ B29D *7/02*

U.S. Cl. 264—564 **14 Claims**

1. A process for reducing block, and increasing slip of blown films of linear low density ethylene copolymers which inherently exhibit high block and low slip, said process comprising

incorporating into the said copolymer, prior to blowing into films, an effective fast-blooming amount in the range of about 0.05 to about 1.5 weight percent of at least one secondary fatty acid amide having a saturated alkyl group and an unsaturated alkyl group, and about 0.01 to about 2 weight percent of finely-divided inorganic, and

extrusion blowing a melt of the mixture into a thin film wherein the linear low density ethylene copolymer comprises ethylene copolymerized with a sufficient amount of at least one alpha, beta-ethylenically unsaturated alkene having from 3 to 12 carbon atoms, to provide a copolymer having a density in the range of about 0.90 to about 0.94 gms./cc,

said copolymers having a melt index in the range of about 0.1 to about 30 gm./10 min. as measured by ASTM-D-1238-(E).

4,430,290

PLASMA CONFINING DEVICE

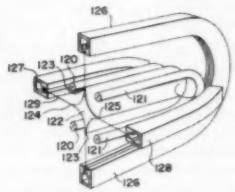
Yuichi Kiryu, 1-12-9, Naka-Cho, Koganei-Shi, Tokyo-To, Japan

Continuation of Ser. No. 63,318, Aug. 2, 1979, abandoned. This application Nov. 2, 1981, Ser. No. 317,639

Claims priority, application Japan, Aug. 25, 1978, 53-103629

Int. Cl.³ G21B *1/00*

U.S. Cl. 376—134 **1 Claim**



1. A plasma confining device comprising:

a plurality of cusp magnetic field means each for generating a cusp magnetic field confining a charged particle plasma, said cusp magnetic field having a line cusp portion, and some of said charged particles escaping through said line cusp portion forming a sheet-shaped charged particle flow

substantially within a two-dimensional plane along said line cusp portion, and

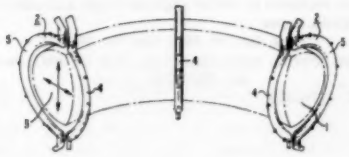
a deflection magnetic field means for generating a deflection magnetic field having a magnetic flux perpendicular to said plane, an edge of the deflection magnetic field being perpendicular to the direction of advancement of the escaping charged particles so that each of the escaping particles enters the deflection magnetic field, is deflected, leaves the magnetic field, and returns substantially within said plane, toward and through the line cusp portion into the inside of the plasma, wherein said deflection magnetic field means further includes neutralizing coils which generate a neutralizing field which will weaken said cusp magnetic field at said deflection magnetic field means, thereby reducing the radius of said deflection field means.

4,430,291

PACKED FLUIDIZED BED BLANKET FOR FUSION REACTOR

John W. H. Chi, Mt. Lebanon, Pa., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed May 12, 1981, Ser. No. 262,729
Int. Cl.³ G21B *1/00*
U.S. Cl. 376—146 **1 Claim**



1. In a fusion plasma system having a circular cross section, said fusion system substantially surrounded by a blanket structure for the capture and transmittal of energy from said plasma, wherein said blanket structure comprises:

(A) a plurality of semicircular pressure tubes, each said tube including two spaced apart substantially parallel perforated walls having an enclosed volume therebetween and defining inlet and outlet conduits outside said enclosed volume said plurality of tubes substantially surrounding said plasma containing system;

(B) first supply means for supplying a fluid coolant flow in a first direction across each of said volumes by means of said inlet and outlet conduits, said first direction being radial to said reactor circular cross section;

(C) second supply means for supplying a fluidization fluid flow in a second direction, in each said volume along the length thereof of each of said tubes, which second direction is substantially opposite the direction of gravitational acceleration, and perpendicular to said first direction; and

(D) a plurality of fuel particles located within each of said volumes, and wherein the fluidization flow in the second direction passes through a particle bed path substantially greater in length than that particle bed path traversed by the coolant flow in the first direction,

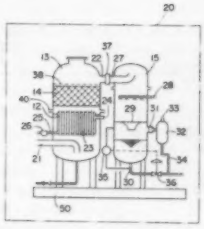
the combination with each pressure tube of a plurality of flow rakes, located at various elevations along the second direction, said flow rakes being annular tubes with a plurality of holes arranged to distribute said second supply means approximately uniformly over the cross section of said pressure tube, said plurality of flow rakes adapted as above to accomplish staged and distributed fluidization flow in said second direction.

4,430,292

RADIOACTIVE GASEOUS WASTE DISPOSING SYSTEM

Hirofumi Shimada, and Hisao Totsuka, both of Yokohama, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kanagawa, Japan

Continuation of Ser. No. 41,891, May 24, 1979, abandoned. This application Jan. 12, 1982, Ser. No. 338,968
Claims priority, application Japan, Jun. 1, 1978, 53-64941
Int. Cl.³ G21C *19/32*; B01J *9/02*
U.S. Cl. 376—301 **1 Claim**



1. In a system for disposing of radioactive gaseous wastes in a nuclear power plant of the type comprising:

a steam turbine;

a first condenser connected to the steam turbine;

a vertically cylindrical recombining unit connected to the first condenser and comprising preheating means for preheating to a predetermined temperature radioactive gaseous wastes fed from the first condenser and catalytic recombining means which forms water vapour from oxygen and hydrogen contained in the radioactive gaseous wastes;

a second condenser connected to an output of said recombining unit; and

means connected to an output of said second condenser for adsorbing and holding up the radioactive gaseous wastes with an adsorbing agent;

the improvement in which said recombining unit is dividable into an upper half in which said recombining means is disposed and a lower half in which said preheating means is disposed, there being a space between said recombining means and said preheating means, said second condenser being disposed downstream of and in direct contact with said recombining unit, and in which the radioactive gaseous wastes are fed from said first condenser into said recombining unit at a portion of said recombining unit near the bottom thereof and pass through said preheating means, said recombining means, and into said second condenser through a portion of said recombining unit near its upper end.

4,430,293

CONTAINMENT HYDROGEN REMOVAL SYSTEM FOR A NUCLEAR POWER PLANT

Vincent M. Callaghan, West Granby; Edward P. Flynn, and Bohdan M. Pokora, both of Windsor, all of Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

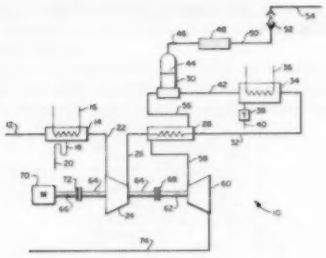
Filed Sep. 10, 1981, Ser. No. 300,770
Int. Cl.³ G21C *19/00, 13/00*
U.S. Cl. 376—314 **13 Claims**

1. In a nuclear power plant having a containment building for containing an atmosphere, a method of separating hydrogen gas from a mixture of hydrogen gas and other gases comprising the steps of:

a. withdrawing a gas stream from the atmosphere of said containment building;

b. cooling said gas to remove a major portion of the water vapor;

c. returning the condensed water to said containment building;
d. compressing said cooled gas;
e. cooling said compressed gas to lower the temperature of said gas and remove additional water vapor;
f. returning the condensed water to said containment building;



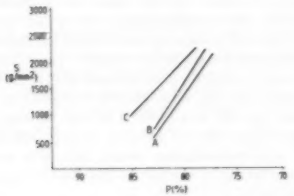
g. separating said cooled gas into a first stream of gas rich in hydrogen and a second stream of gas that is hydrogen depleted;
h. passing said first stream of gas rich in hydrogen to disposal; and
i. returning said second stream to said containment building.

4,430,294

PROCESS FOR PRODUCING POROUS NICKEL BODIES

Victor A. Tracey, Solihull, England, assignor to Inco Europe Limited, London, England

Filed Jun. 3, 1981, Ser. No. 270,048
Claims priority, application United Kingdom, Jun. 9, 1980, 8018807
Int. Cl.³ B22F 3/10
U.S. Cl. 419—2 **4 Claims**



1. A process for the production of porous nickel bodies characterized by high strength, residual carbon content below about 0.08% (by weight), and a porosity exceeding 75%, the process consisting essentially of:
(a) providing a carbonyl nickel powder,
(b) forming a nickel-carbon mixture by adding carbon particles to the nickel powder in an amount sufficient to raise the carbon content thereof to about 0.35–2% (by weight) carbon, the particle size of the carbon no greater than the particle size of the nickel powder,
(c) forming a green body from the mixture,
(d) sintering the body in a reducing atmosphere, the temperature of the reducing atmosphere between 750° C. and 1050° C., the reducing atmosphere consisting essentially of hydrogen, nitrogen and 15–30% (by volume) carbonaceous gas, for the time necessary to maintain the porosity of the body above 75%.

4,430,295

ARTICLES PRODUCED FROM IRON POWDER COMPACTS CONTAINING HYPEREUTECTIC COPPER PHOSPHIDE POWDER

William F. Jandeska, Jr., Rochester, Mich., assignor to General Motors Corporation, Detroit, Mich.

Continuation of Ser. No. 139,102, Apr. 10, 1980, abandoned. This application Nov. 19, 1981, Ser. No. 322,868
Int. Cl.³ B22F 3/00
U.S. Cl. 419—46 **5 Claims**

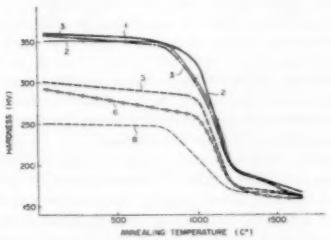
1. A method for forming an article from iron powder comprising
compacting a powder mixture comprising plain iron particles and a hypereutectic copper phosphorus sintering agent, and
sintering the compact at a temperature between about 950° C. and 1120° C. to cause the copper phosphorus agent to form a liquid capable of wetting the surface of the iron particles, said sintering being carried out for a time sufficient for phosphorus to diffuse into the iron particles and for the remaining copper-enriched liquid to flow and wet iron surfaces in the compact and thereafter form a solidified copper-rich layer on pore surfaces within the product sintered article.

4,430,296

MOLYBDENUM-BASED ALLOY

Hideo Koizumi, Tokyo; Hideo Ishihara; Tatsuhiko Matsumoto, both of Yokohama, and Katsuhiko Kawakita, Yokosuka, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jun. 24, 1982, Ser. No. 391,685
Claims priority, application Japan, Jun. 25, 1981, 56-97526
Int. Cl.³ C22C 27/04
U.S. Cl. 420—429 **3 Claims**



1. A molybdenum-based alloy resistant to embrittlement upon irradiation with neutrons and consisting of 0.1 to 2.5% by weight of vanadium, 10 to 100 ppm of boron, 10 to 1,000 ppm of carbon, and the balance of molybdenum.

4,430,297

HARD NICKEL-BASE ALLOY RESISTANT TO WEAR AND CORROSION

Paul Crook, Fairford, England, assignor to Cabot Corporation, Kokomo, Ind.

Filed Jan. 7, 1980, Ser. No. 110,264
Claims priority, application United Kingdom, Jan. 11, 1979, 7901144
Int. Cl.³ C22C 19/05
U.S. Cl. 420—442 **16 Claims**

1. A nickel-based hard alloy consisting essentially of the following composition (excluding impurities)

	% by weight of composition
(a) chromium	32 to 40

-continued

	% by weight of composition
(b) molybdenum plus tungsten	8 to 15
(c) carbon	0.55 to 2.5
(d) one or more elements selected from the group consisting of niobium, titanium, vanadium, tantalum, hafnium and zirconium	1 to 7.5
(e) silicon plus manganese	0 to 5
(f) copper	up to 5
(g) aluminium	0 to 2
(h) one or more elements selected from the group consisting of the rare earths	0 to 2
(i) boron	0 to 1
(j) iron	0 to 25
(k) nickel	balance

wherein

(1) there is at least 42% by weight of the nickel in the composition:

(2) the combined weight of boron (if present) and carbon is not greater than 2.5%;

(3) one or more elements from the group consisting of vanadium, tantalum, hafnium and zirconium are present only when the carbon content exceeds 1.0%;

said alloy being cobalt-free except as an adventitious impurity and made by first melting the alloy and then casting the molten alloy into a useful form.

4,430,298

COPPER ALLOYS FOR ELECTRIC AND ELECTRONIC DEVICES AND METHOD FOR PRODUCING SAME

Motohisa Miyafuji, Yamaguchi; Takashi Matsui, Shimonoseki; Hidekazu Harada, Shimonoseki; Masumitsu Soeda, Shimonoseki; Shin Ishikawa, Shimonoseki; Hiroshi Murakado, Shimonoseki; Hiroaki Kawamoto, Shimonoseki; Takeo Tabuchi, Shimonoseki; Kunio Kamada, Shimonoseki, and Yasuhiro Nakashima, Shimonoseki, all of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Jun. 6, 1983, Ser. No. 501,110

Claims priority, application Japan, Jun. 5, 1982, 57-96484

Int. Cl.³ C22C *9/06*

U.S. Cl. 420—481 **3 Claims**

1. A copper alloy for electric and electronic devices, comprising: 3.0–3.5 wt% of Ni, 0.5–0.9 wt% of Si, 0.02–1.0 wt% of Mn, 0.1–5.0 wt% of Zn and the balance Cu and the inevitable impurities.

4,430,299

APPARATUS FOR MONITORING CHEMICAL REACTIONS

Thomas Horne, Harpenden, England, assignor to Coulter Electronics, Inc., Hialeah, Fla.

Filed Jun. 18, 1981, Ser. No. 275,104

Int. Cl.³ G01N *35/04*

U.S. Cl. 422—64 **24 Claims**

1. Apparatus for monitoring chemical reactions occurring or having occurred in a plurality of sample substances carried respectively by a plurality of cartridges of generally strip-like planar construction, the reaction occurring or having occurred in any cartridge being detected by directing a beam of radiant energy to illuminate a cartridge at a radiant energy receiving surface thereof which provides access to said substance carried by the cartridge and measuring the modified radiation reflected from the sample substance carried by said cartridge and the radiant energy receiving surface, said apparatus comprising:

A. a stationary support structure,

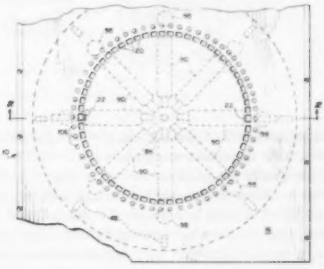
B. a plurality of cartridges of generally strip-like planar construction,

C. means on said structure for fixedly supporting a plurality of said cartridges in a geometric line array and each cartridge having a sample substance carried thereby and a radiant energy receiving surface providing access for radiant energy to said sample substance, the radiant energy receiving surfaces of all said cartridges facing to the same side of said array, said cartridges being supported by said supporting means in such a manner as to enable the removal and replacement of any one independently of all others,

D. a movable carrier on said support structure and means mounting said movable carrier for guided movement substantially parallel to said geometric line,

E. at least one photometer carried on said movable carrier, said photometer having a source of radiant energy and means forming a beam of said radiant energy and directing said beam to said cartridges, the formed beam being disposed to impinge against said cartridges at the radiant energy receiving surfaces thereof as the movable carrier moves relative to said array,

F. the angle of impingement of said beam with said radiant



energy receiving surfaces relative to the planes of said surfaces being such as to enable detection of reflected radiant energy,

G. said photometer including photoresponsive means on the same side of said surface as said beam arranged to receive modified radiation reflected from said cartridges directly from said surfaces, the spatial relationship of the beam forming means and photoresponsive means being fixed,

H. means for moving the movable carrier on a program of movement to direct said beam at the cartridges selectively if not sequentially, the cartridge support being such that said removal of any one of said cartridges from said support being accomplished without interruption of said program of movement of said movable carrier,

I. the photoresponsive means being responsive to the modified reflected radiation to produce an electrical signal related to the chemical condition of the sample substance, if any, carried by the cartridge which the directed beam illuminates, movement of the movable carrier serving to produce a plurality of said signals from the sample substances of those cartridges which have been illuminated,

J. means for generating usable data from said signals and

K. means for coupling the signals from the carrier to said last-mentioned means.

4,430,300

FLUID CATALYST REGENERATION APPARATUS

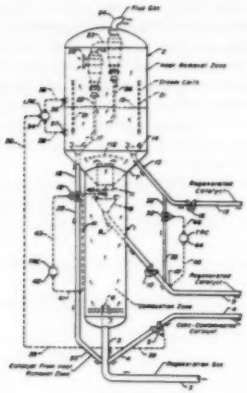
Anthony G. Vickers, Arlington Heights, Ill., assignor to UOP Inc., Des Plaines, Ill.

Division of Ser. No. 303,256, Sep. 17, 1981, Pat. No. 4,371,501, which is a division of Ser. No. 118,372, Feb. 4, 1980, Pat. No. 4,309,308, which is a continuation-in-part of Ser. No. 969,607, Dec. 14, 1978, Pat. No. 4,219,442. This application Sep. 22, 1982, Ser. No. 421,696

The portion of the term of this patent subsequent to Jan. 6, 1998, has been disclaimed.

Int. Cl.[3] **B01J** *21/20, 29/38, 8/26;* **C10G** *11/18*

U.S. Cl. 422—109 **2 Claims**



1. An apparatus for regenerating a coke-contaminated, fluid catalyst, which apparatus comprises:

(a) a vertically oriented combustion chamber having two sections, a lowermost and uppermost section, wherein said lowermost section is a relatively dense-phase lowermost combustion section containing fluidized catalyst in a relatively dense-phase and said uppermost section is a relatively dilute phase uppermost combustion section containing fluidized catalyst in a relatively dilute phase having a catalyst to gas mixtures of from about 2 to about 10 lbs. per cubic foot;

(b) a spent catalyst inlet conduit for gas and fluid catalyst connecting with said lowermost section of said combustion chamber containing said relatively dense-phase;

(c) a heat removal chamber located superadjacent with respect to said combustion chamber and in direct communication with said relatively dilute phase uppermost combustion section;

(d) a heat removal means disposed within said heat removal chamber;

(e) a catalyst withdrawal conduit connected at one end to said heat removal chamber for withdrawing regenerated fluidized catalyst from said heat removal chamber;

(f) a catalyst recycle conduit connecting said heat removal chamber with said spent catalyst inlet conduit, said inlet conduit providing communication of said heat removal chamber with said relatively dense-phase lowermost combustion section of said combustion chamber, whereby regenerated fluidized catalyst is passed from said heat removal chamber, through said recycle catalyst conduit and spent catalyst inlet conduit to said relatively dense-phase lowermost combustion section; and,

(g) a control system which comprises:

(i) means to sense the temperature in said dilute-phase of fluidized catalyst at a locus within said relatively dilute phase uppermost combustion section;

(ii) temperature control means having an adjustable set point connecting with said temperature sensing means and developing an output signal;

(iii) flow control means regulating the rate of flow of said regenerated catalyst through said catalyst recycle conduit; and

(iv) means for transmitting said output signal to said flow control means in said catalyst recycle conduit, whereby the latter is adjusted responsive to said dilute-phase catalyst temperature sensed in said relatively dilute phase uppermost combustion section.

4,430,301

APPARATUS FOR REMOVING A SAMPLE OF AT LEAST ONE PHASE FROM A MOVING MIXED PHASE

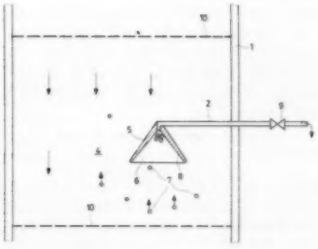
Heinz Evers, Linkenheim, Fed. Rep. of Germany, assignor to Wiederaufbereitungsanlage Karlsruhe Betriebsgesellschaft mbH, Eggenstein-Leopoldshafen, Fed. Rep. of Germany

Filed Sep. 16, 1981, Ser. No. 302,531

Claims priority, application Fed. Rep. of Germany, Sep. 17, 1980, 3034961

Int. Cl.[3] **B01D** *11/00*

U.S. Cl. 422—119 **9 Claims**



1. An extraction apparatus for extracting a sample of at least one phase from a mixed phase moving through a walled transporting means with said mixed phase comprising two substantially mutually insoluble liquids of different densities which are moving in opposite directions in the transporting means and which form a dispersed phase and a continuous phase which are countercurrent to one another, said apparatus comprising: at least one pipe which passes through the wall of the transporting means and has a funnel-shaped end having a conical inner wall, said funnel-shaped end projecting into the mixed phase and presenting an opening for capture of only one of the dispersed and continuous phases, and said funnel-shaped end is oriented in the mixed phase such that the width of its said opening is at right angles to the direction of movement of the two countercurrent phases and faces in the direction of movement of the one of the two countercurrent phases to be extracted.

4,430,302

FLUIDIZED CATALYST REGENERATION APPARATUS

Bogdan J. Krause, Mt. Prospect, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Apr. 12, 1982, Ser. No. 367,495

Int. Cl.[3] **B01J** *8/24*

U.S. Cl. 422—144 **4 Claims**

1. An apparatus for performing a chemical reaction which comprises:

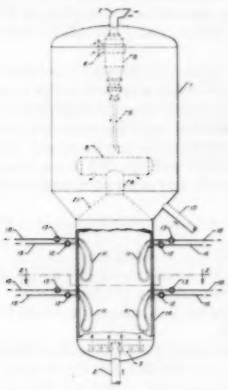
(a) an enclosed reaction vessel having a substantially vertical sidewall;

(b) means to maintain a fluidized bed of a particulate material within the reaction vessel;

(c) a plurality of heat exchange fluid manifold systems located at different points outside the reaction vessel, with

each manifold system comprising separate and independent fluid delivery and fluid collection conduits; and,

(d) a plurality of heat exchange means located within said fluidized bed at different levels along said vertical sidewall having a length each of which comprises a plurality of U-shaped looped heat exchange coils, with each heat exchange coil having two terminal portions which pass through said sidewall of the reaction vessel, each of which



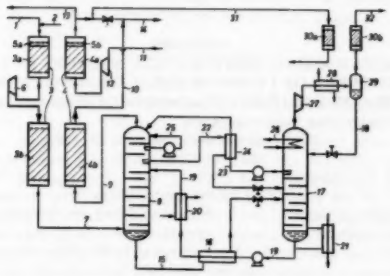
has at least two-thirds of said length located below said terminal portions, with one terminal portion of each heat exchange coil communicating with a fluid delivery conduit and with the other terminal portion of each heat exchange coil communicating with a fluid collection conduit of the same manifold system and wherein the entire said length of at least some of said U-shaped coils is situated at a point above the uppermost portion of at least some of said coils.

4,430,303

REMOVAL OF UNDESIRABLE GASEOUS COMPONENTS FROM A HOT WASTE GAS

Gerhard Linde, Grunwald, Fed. Rep. of Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Filed Sep. 30, 1982, Ser. No. 429,409
Int. Cl.³ F01N *3/10*
U.S. Cl. 422—170 **6 Claims**



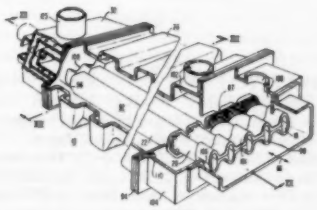
1. Apparatus for conducting a process for the removal of undesirable gaseous components from a hot waste gas containing sulfur dioxide and nitrogen oxides, wherein the waste gas is catalytically reduced and then cooled, said apparatus comprising a waste gas conduit, a regenerator housing arranged in the flow path of the waste gas conduit, catalyst packing and heat-accumulating mass being serially arranged in the regenerator housing so that said waste gas first contacts the catalyst packing and then the heat accumulating mass within said regenerator housing; gas supply means for feeding ammonia into the waste gas, said gas supply means being in communication with the waste gas conduit upstream of the catalyst packing; and scrubbing means for removing sulfur dioxide from said waste gas, said scrubbing means arranged downstream of and in communication with said regenerator housing.

4,430,304

SLAB REFORMER

Francis R. Spurrier, Whitehall; Egon A. DeZubay, Mt. Lebanon; Alexander P. Murray, Murrysville, and Edward J. Vidt, Churchill, all of Pa., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Nov. 13, 1981, Ser. No. 321,131
Int. Cl.³ F28D *21/00*
U.S. Cl. 422—204 **12 Claims**



1. A catalytic reformer comprising:

a hollow elongated flat non-circular slab;

a duct disposed horizontally within said slab and extending along a longitudinal axis of said slab, said duct forming a first annular region between said slab and said duct;

a shell disposed within said duct forming a second annular region between said duct and said shell;

a bed of catalytic material disposed within said second annular region within said slab;

means for flowing a reformable gaseous medium through said bed; and

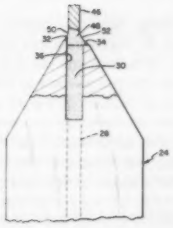
means for heating said bed from within said slab.

4,430,305

DISPLACED CAPILLARY DIES

Juris P. Kalejs, Wellesley; Bruce Chalmers, Falmouth, both of Mass., and Thomas Surek, Englewood, Colo., assignors to Mobil Solar Energy Corporation, Waltham, Mass.

Filed Feb. 12, 1979, Ser. No. 11,527
Int. Cl.³ C30B *15/34*
U.S. Cl. 422—246 **9 Claims**



1. Apparatus for use in growing a crystalline body of silicon from a melt so that silicon carbide precipitating from the melt will be distributed asymmetrically in the crystalline body, said

apparatus comprising a crucible made of graphite or quartz and formed with a closed bottom end and an open top end, and a capillary die having a die body made solely of graphite and characterized by an upper end, a lower end and a capillary, said upper end comprising first and second end surfaces spaced from one another so as to provide an opening for said capillary, said first end surface being located at a greater distance from said lower end than said second end surface, and means for supporting said die so that said lower end projects into the crucible in position to be immersed in a silicon melt contained in the crucible, whereby when a crystalline body of silicon is grown from a film of melt which is supported by said end surfaces and replenished via said capillary, said film will have a first meniscus extending between said die body and said first end surface and a second meniscus extending between said die body and said second end surface, with said second meniscus being longer and extending lower than said first meniscus.

4,430,306

OXYGEN RECYCLE TYPE OZONIZING APPARATUS

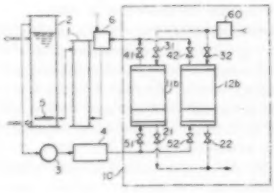
Keisuke Namba; Masaaki Tanaka; Takanori Ueno, and Norikazu Tabata, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 152,318, May 22, 1980, abandoned. This application Dec. 2, 1981, Ser. No. 326,760

Claims priority, application Japan, May 29, 1979, 54-66549

Int. Cl.³ A61L *2/20;* **B01D** *53/04;* **C02F** *1/50, 1/78*

U.S. Cl. 422—292 **1 Claim**



1. An oxygen recycled type ozonizing apparatus for feeding ozonized oxygen to a liquid or solid object part containing organic materials to be treated with said ozonized oxygen and subsequently treating the gas discharge after the reaction to reuse it as a source of oxygen for producing ozone, comprising:

a source of oxygen with said source producing oxygen which is essentially substantially pure oxygen;

an ozonizing means for producing ozonized oxygen from said substantially pure oxygen;

a reacting means for reacting the liquid or the object to be treated with the ozonized oxygen produced in said ozonizing means;

a temperature-swing recovery means connected to said reacting means for recovering the discharged gas of the reacting means to adsorb and remove the impurities contained in the discharged gas and to feed the gas to resupply said source of substantially pure oxygen which is, in turn, fed to said ozonizing means, wherein said recovery means holds a first adsorbant of one of silica gel and activated aluminum for adsorbing mainly water in the discharged gas and a second adsorbant of one of Ca A type and X type zeolite for adsorbing mainly volatile organic materials and CO_2 gas in said discharge gas, said first adsorbent being located upstream of said second adsorbent, and heater means for heating said second adsorbant to a temperature of 250° C. in order to carry out said adsorbing operation.

4,430,307

METHOD FOR SEPARATING THE ISOTOPES OF AN ELEMENT IN PARTICULAR OF A METAL HAVING A HIGH ATOMIC WEIGHT

Raymond Peltier, 11 Square Jasmin, 75016 Paris, France

PCT No. PCT/EP78/00003, § 371 Date Feb. 28, 1979, § 102(e) Date Feb. 28, 1979, PCT Pub. No. WO79/00025, PCT Pub. Date Jan. 25, 1979

PCT Filed Jun. 30, 1978, Ser. No. 159,225

Claims priority, application France, Jul. 4, 1977, 77 20491

Int. Cl.³ B03D *1/00, 1/02, 1/06;* **C01G** *56/00*

U.S. Cl. 423—3 **8 Claims**

1. A process for the separation of isotopes from a heavy metal comprising forming a tension active compound of said metal with a soap, dissolving said compound in a liquid having a strong surface tension, injecting a non-miscible body into the solution of said compound in said liquid and thereby forming a plurality of separation surfaces, and recovering the fraction of the solution adjacent said separation surfaces enriched in the lighter isotope.

4,430,308

HEATED ION EXCHANGE PROCESS FOR THE RECOVERY OF URANIUM

Argell Fletcher, Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 13, 1982, Ser. No. 449,125

Int. Cl.³ C01G *43/00;* **C22B** *60/02*

U.S. Cl. 423—7 **20 Claims**

1. A method for the recovery of uranium values from a uranium-containing lixiviant, comprising the steps of:

(a) passing said lixiviant through an ion-exchange resin to cause said resin to retain uranium values, wherein the ion exchange resin is heated to a temperature sufficient to cause a substantial increase in uranium loading capacity as compared to ambient temperatures; and

(b) recovering said uranium values from said ion-exchange resin.

15. A process for the recovery of uranium values from uranium-containing ore additionally containing molybdenum values, comprising the steps of:

(a) contacting the ore with an aqueous leaching solution to solubilize uranium and molybdenum values;

(b) passing the leachate through an anion-exchange resin wherein the resin is heated to a temperature sufficient to cause the resin to selectively retain uranium values and to cause a substantial increase in uranium loading capacity; and

(c) recovering said uranium values from said anion exchange resin.

4,430,309

ACID WASH OF SECOND CYCLE SOLVENT IN THE RECOVERY OF URANIUM FROM PHOSPHATE ROCK

William R. York, Bartow, Fla., assignor to Wyoming Mineral Corporation, Lakewood, Colo.

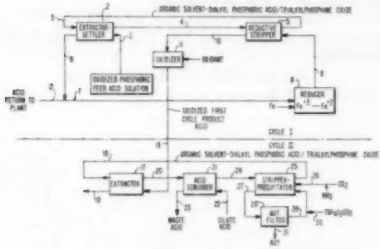
Filed Aug. 12, 1981, Ser. No. 292,096

Int. Cl.³ C01G *43/00*

U.S. Cl. 423—10 **6 Claims**

1. In the process of recovering uranium from an aqueous solution of wet process phosphoric acid feed, comprising a first and a second cycle, where phosphoric acid is passed through extractor means and stripper means in both cycles, where the first cycle utilizes reductive stripping and both the first and second cycle utilize an organic extractant solvent containing a di-alkyl phosphoric acid having from about 4 to 10 carbon atoms in each alkyl chain and a synergistic additive agent; the improvement comprising treating the second cycle organic solvent stream, from the second cycle extractor means, containing entrained H_3PO_4, to remove H_3PO_4 therefrom, before said solvent has passed through the second cycle stripper means, said treating consisting of acid scrubbing said second cycle organic solvent stream containing entrained H_3PO_4 with

an aqueous acidic solution consisting of water and from about 2 vol. % to about 10 vol. % of acid selected from the group consisting of sulfuric acid and nitric acid, said acidic solution added in an amount effective to remove entrained H_3PO_4 and



maintain the pH of the organic solvent stream exiting the acid scrubber at a value of between 3 and 6.5, to provide a substantially H_3PO_4 free organic solvent stream which is then fed directly into the second cycle stripper means.

4,430,310

PURIFICATION OF IMPURE BAYER PROCESS LIQUORS

John T. Malito, and Gordon C. Rogers, Jr., both of Baton Rouge, La., assignors to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Filed Feb. 8, 1983, Ser. No. 464,817
Int. Cl.³ C01F *7/06*
U.S. Cl. 423—121 **10 Claims**

1. In the process of purifying impure caustic Bayer process liquors by addition of an organic solvent of low-boiling point to precipitate foreign salts, the improvement which comprises contacting the impure caustic liquor, after removal of substantially all of its dissolved alumina content by the conventional seeding and precipitation method, with a solvent selected from the group consisting of methanol, propanol, butanol, and mixtures thereof, the solvent selected being incapable of forming an azeotrope with the liquor and essentially miscible with the caustic liquor, maintaining the contact between the solvent-liquor mixture at a temperature below the temperature of about 90° C. for a time sufficient to at least induce the precipitation of sodium carbonate, sodium sulfate, or mixtures of these impurities, thus forming a solid phase consisting of impurities and a liquid phase containing the solvent and purified caustic liquor, separating the phases, recovering the solvent from the liquid phase and recycling the purified, solvent-free liquor to the Bayer process.

4,430,311

ALUMINA COMPOUNDS IN ION EXCHANGE RESINS

John M. Lee, and William C. Bauman, both of Lake Jackson, Tex., assignors to The Dow Chemical Co., Midland, Mich.

Division of Ser. No. 95,681, Nov. 19, 1979, Pat. No. 4,381,349.
This application Apr. 22, 1983, Ser. No. 487,540
Int. Cl.³ B01J *41/00, 41/12*
U.S. Cl. 423—179.5 **12 Claims**

1. In a process for recovering Li^+ from brine by the use of a composite comprising an ion exchange resin having dispersed therein crystalline $LiX.2Al(OH)_3$, where X is halide, the improvement which comprises the use of a composite prepared by:

precipitating $Al(OH)_3$ in the reticules of a weak-base anion exchange resin by the in-situ ammonia precipitation of Al halide in aqueous media, thereby forming a composite of anion exchange resin having $Al(OH)_3$ dispersed therein, followed by the additional steps of

(a) slightly acidifying the so-formed composite in an aqueous medium with HX, X being halide, where the amount of HX is an amount sufficient to provide an acid pH of not lower than about 5.0, thereby converting the anion exchange resin to the halide salt form,

(b) subtantially separating the composite from the aqueous portion,

(c) substantially flooding the composite with an aqueous solution of Al halide, draining the excess solution,

(d) adding NH_4OH to precipitate additional $Al(OH)_3$ in the resin, and

(e) reacting with a Li compound at elevated temperature to form crystalline $LiX.2Al(OH)_3$ dispersed in the resin.

4,430,312

REMOVAL OF CO_2 FROM GAS MIXTURES

Allen G. Eickmeyer, 8126 El Monte, Prairie Village, Kans. 66208

Filed Jun. 23, 1982, Ser. No. 391,303
Int. Cl.³ B01D *53/34*
U.S. Cl. 423—223 **9 Claims**

1. In a method for absorbing CO_2 from a gas mixture containing the same wherein a hot absorption solution having from 15 to 40% by weight of potassium carbonate is continuously circulated at a circulation rate through an absorption stage and a regeneration stage, said gas mixture is contacted with said solution in said absorption stage to absorb CO_2 from the mixture, and said solution is thereafter regenerated in said regeneration stage by removal of CO_2 therefrom, the improvement which comprises the steps of:

adding to said solution from about 2 to 10% by weight equivalent V_2O_5 and from about 1 to 10% by weight of equivalent KBO_2, the weight ratio of equivalent KBO_2 to equivalent V_2O_5 being less than 1.5:1; and

reducing said circulation rate by an amount of up to about 45%.

4,430,313

SHIPPING BLACK PHOSPHORIC ACID

Mark D. LaVanture, and George L. Walker, both of Richmond, Va., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 177,033, Aug. 11, 1980, abandoned.
This application Apr. 11, 1983, Ser. No. 482,277
Int. Cl.³ C01B *25/16*
U.S. Cl. 423—321 R **5 Claims**

1. A method for transporting black wet process phosphoric acid without the removal of settled material, said method comprising the steps of:

(i) admixing a small amount of HNO_3 with said black acid, said amount of HNO_3 being sufficient to render settled material in said black acid resuspendable with mild agitation; and

(ii) transporting said black acid of step (i) in a storage tank of a moving vehicle, wherein the movement of said vehicle creates sufficient agitation of said black acid to keep said solid material in suspension, whereby the settled material of said black acid in the absence of said mixing step (i) would have formed a cake material in said transporting step (ii), said cake material not being resuspendable by vigorous agitation.

4,430,314

METHOD OF PREPARING CRYSTALLINE ZEOLITE

Costandi A. Audeh, Princeton, and William J. Reagan, Englishtown, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 156,902, Jun. 6, 1980, abandoned. This application Apr. 5, 1982, Ser. No. 365,472
Int. Cl.³ C01B *33/20*
U.S. Cl. 423—326 **4 Claims**

3. A method of preparing in situ a catalyst composition

consisting essentially of a ZSM-5 zeolite in an inorganic oxide binder which comprises:

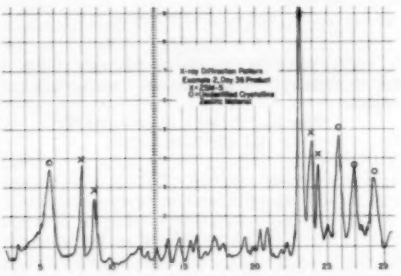
(a) preparing a reaction mixture containing a source of an alkali metal oxide, an oxide of silicon, optionally an oxide of aluminum, R_2O, and water, and having a composition, in terms of mole ratios of oxides, falling within the following ranges:

SiO_2/Al_2O_3=10 to ∞

M_2O/SiO_2=0.01 to 3.0

R_2O/M_2O=0.01 to 2.0

OH/SiO_2=0 to 1.0



wherein M is an alkali or alkaline earth metal and R_2O is an organic nitrogen-containing oxide selected from the group consisting of 4-picoline-N-oxide and a trialkyl-amine-N-oxide wherein the alkyl group comprises C_2–C_5 hydrocarbons,

(b) maintaining said mixture under crystallization conditions until crystals consisting essentially of ZSM-5 and an unidentified crystalline material having the X-ray diffraction pattern of Table II are formed, and

(c) subjecting said crystals to thermal treatment effective to cause the unidentified crystalline material to collapse forming an inorganic oxide binder for the ZSM-5.

4,430,315

CATALYTIC DECOMPOSITION OF HYPOCHLORITE USING SUBSTITUTED COBALT OXIDE SPINELS

Donald L. Caldwell, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Dec. 28, 1981, Ser. No. 334,791

Int. Cl.³ C01D 3/04; C01B 13/02

U.S. Cl. 423—499 **12 Claims**

1. In a process of catalytically decomposing hypochlorites into oxygen and chloride by use of a cobalt spinel catalyst, the improvement which comprises

using a substituted cobalt spinel catalyst which conforms generally to the spinel structure

$$M_xN_yCo_{3-(x+y)}O_4$$

where zero$<x\leq 1$; zero$\leq y\leq 0.5$; zero$<(x+2y)\leq 1$; M is at least one metal of Periodic Table Groups IB, IIA, and IIB; and N is at least one metal from Group IA, wherein the "half life" of the decomposition of hypochlorite into oxygen and chloride using the substituted cobalt spinel catalyst is less than "half life" of said decomposition using unsubstituted Co_3O_4 spinel catalyst.

4,430,316

SCRUBBING SYSTEM YIELDING HIGH CONCENTRATION OF HYDROGEN SULFIDE

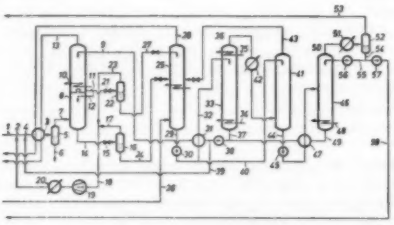
Gerhard Ranke, Pöcking, and Horst Weiss, Munich, both of Fed. Rep. of Germany, assignors to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Filed Dec. 8, 1981, Ser. No. 328,553

Claims priority, application Fed. Rep. of Germany, Dec. 18, 1980, 3047829

Int. Cl.³ C01B 17/04; B01J 14/00

U.S. Cl. 423—573 R **16 Claims**



1. In a process for the separation of at least hydrogen sulfide and carbon dioxide from a raw gaseous mixture in order to form a purified gaseous mixture, comprising scrubbing the gaseous mixture in a first scrubbing stage with a physical scrubbing liquid having a higher absorbability for hydrogen sulfide than for carbon dioxide, withdrawing from the scrubbing stage at least a first stream of scrubbing liquid loaded with hydrogen sulfide and carbon dioxide, and thermally regenerating the loaded scrubbing liquid to form (a) a gaseous phase containing hydrogen sulfide, and (b) regenerating scrubbing liquid,

the improvement which comprises scrubbing said gaseous phase containing hydrogen sulfide in a second scrubbing stage with a stream of scrubbing liquid capable of absorbing the major quantity of H_2S in said gaseous phase; and subjecting resultant second stream of scrubbing liquid loaded with hydrogen sulfide to a separation stage comprising rectification to form a bottoms of regenerated scrubbing liquid and an overhead of a gaseous phase rich in hydrogen sulfide, and further comprising a hydrogen sulfide enrichment stage provided downstream of the first scrubbing stage and upstream of the thermal regenerating and second scrubbing stage, separating in said stage CO_2 from the first loaded stream of scrubbing liquid, and employing a partial stream of resultant CO_2-depleted scrubbing liquid stream withdrawn from the hydrogen sulfide enrichment stage to scrub said gaseous phase which contains hydrogen sulfide in said second scrubbing stage to form said resultant second stream of scrubbing liquid loaded with hydrogen sulfide, and subjecting another partial stream of resultant CO_2-depleted scrubbing liquid to the thermal regenerating step to form said gaseous phase containing hydrogen sulfide.

4,430,317

LOW TEMPERATURE CLAUS PROCESS WITH WATER REMOVAL

Robert L. Reed, Tulsa, Okla.; Luther E. Petty, Darien, Ill., and Clifton S. Goddin, Jr., Tulsa, Okla., assignors to Standard Oil Company (Indiana), Chicago, Ill.

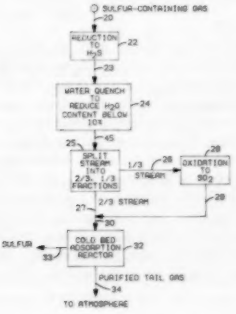
Continuation-in-part of Ser. No. 239,730, Mar. 2, 1981, abandoned. This application Jan. 28, 1982, Ser. No. 343,661

Int. Cl.³ C01B 17/04; B01J 8/04

U.S. Cl. 423—574 R **16 Claims**

1. A method of treating an effluent tail gas stream from a final reactor in a Claus plant comprising a mixture of water and sulfur containing compounds including hydrogen sulfide and sulfur dioxide, the method comprising;

(a) converting substantially all sulfur-containing compounds of said tail gas stream to hydrogen sulfide;
(b) cooling the thus-produced stream to below 247° F. and reducing water content of the thus-produced stream to below 10% by volume to produce a cooled dried stream;
(c) creating a 2:1 molar ratio gaseous reaction mixture of H_2S to SO_2 in the thus-produced stream;
(d) catalytically converting said gaseous reaction mixture of



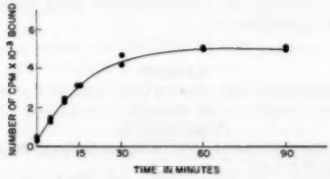
H_2S and SO_2 to sulfur and water by additional Claus conversion at a temperature in the range of about 160° F.–260° F.; and
(e) in the event of process upset in any of steps (a)–(c), omitting steps (a)–(c), feeding said tail gas stream directly to a Claus catalytic reactor means, and catalytically converting sulfur compounds in said stream to sulfur and water by additional Claus conversion at a temperature in the range of about 250° F.–300° F.

4,430,318

IMMUNOASSAY UTILIZING ^{125}I PROTEIN A

John J. Langone, Germantown, Md., assignor to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Continuation of Ser. No. 964,654, Nov. 29, 1978. This application Oct. 1, 1981, Ser. No. 307,536
Int. Cl.³ G01N *33/48, 33/60*
U.S. Cl. 424—1.1 **8 Claims**



1. A method of making ^{125}I-labelled Protein A (PA) for use utilizing as a tracer for the quantitative determination of proteins and haptens in physiological fluids comprising the preparation of ^{125}I PA from ^{125}I which has been evaporated from benzene and attached to Protein A in an amino acid mixture, followed by gel separation.

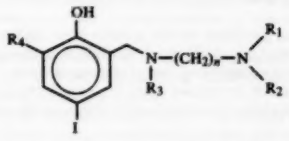
4,430,319

RADIOACTIVE IODINE LABELED PHENOLIC AMINES

Monte Blau, Buffalo; Hank F. Kung, Amherst, and Kenneth M. Tramposch, East Amherst, all of N.Y., assignors to State University of New York, Albany, N.Y.

Filed May 21, 1982, Ser. No. 380,720
Int. Cl.³ A61K *43/00, 49/00*
U.S. Cl. 424—1.1 **27 Claims**

8. A method for selectively depositing a radiopharmaceutical compound having radiation readily observable by radiation detecting means into at least one target tissue or organ of a mammal, the target tissue organ having a physiologically significantly different intercellular pH that the blood of the mammal, the method comprising the step of introducing into the blood stream of a mammal, a radiopharmaceutical compound having the general formula:



wherein R_1, R_2, R_3 and R_4 are independently between 1 and 10 carbons and n is an integer between 1 and 20.

4,430,320

RADIOACTIVE DIAGNOSTIC AGENT

Akiyo Shigematsu, Hachioji; Akira Tsuya, Tokyo; Michiaki Aihara; Akiko Suzuki, both of Kashiwa, and Michiko Matsuda, Sakura, all of Japan, assignors to Kabushiki Kaisha Seitai Kagaku Kenkyusho, Tokyo, Japan

Filed Oct. 8, 1981, Ser. No. 309,764
Int. Cl.³ A61K *43/00, 49/00*
U.S. Cl. 424—1.1 **7 Claims**

2. A radioactive diagnostic composition, comprising: an effective imaging amount of monoiodoacetic acid wherein the iodine atom is radioactive and a pharmaceutically acceptable carrier therefor.

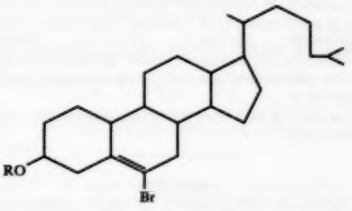
4,430,321

6-BROMOCHOLESTEROL DERIVATIVES

Richard J. Flanagan, Alberta, and Leonard I. Wiebe, Edmonton, both of Canada, assignors to Merck Frosst Canada Inc., Kirkland, Canada

Filed Jan. 15, 1982, Ser. No. 339,265
Int. Cl.³ A61K *49/02, 43/00*
U.S. Cl. 424—1.1 **8 Claims**

1. A 6-bromocholesterol of the formula:



labeled with ^{77}Br or ^{82}Br wherein R is H or lower alkanoyl.

4. A method of investigative diagnosis which comprises introducing into a live mammal a 6-bromocholesterol compound of claim 1 labelled with ^{77}Br or ^{82}Br and subsequently observing the radiation localized in individual glands of said mammals.

4,430,322
MODIFIED GLUCANS AS ANTI-CARIES AGENT AND METHOD OF USE
Thomas H. Stoudt, Westfield, and Karl H. Nollstadt, Clark, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.
Division of Ser. No. 205,030, Nov. 7, 1980, Pat. No. 4,340,675.
This application Apr. 28, 1982, Ser. No. 372,509
Int. Cl.³ A61K 7/16, 31/715; C08B 37/00; C12P 19/18
U.S. Cl. 424—49 9 Claims

5. A glucan with a molecular weight in excess of 500,000, consisting predominantly of α-(1→6)glucosidic bonds and inert to enzymatic attack by an endo-α-(1→6)-glucan-6-glucanohydrolase produced by the process which comprises cell-free biosynthesis of plaque polysaccharides in a biosynthetic medium containing from 5–40 units/ml of the endo-α-(1→6)glucan-6-glycanohydrolase for 24–48 hours at 37° C., inactivating the enzymes, removing insoluble polysaccharides and adding a miscible organic solvent to precipitate the desired glucan.

6. A glucan produced by the process of claim 5 wherein the endo-α-(1→6)glucan-6-glucanohydrolase is dextranase.

9. A method of inhibiting dental plaque, caries and periodontal disease which comprises ingesting an effective amount of the glucan of claim 6 concomitantly with a sucrose-containing foodstuff.

4,430,323
METHOD FOR CONTROLLING ORAL MAL ODORS AND DENTAL PLAQUE
Jules Silver, 7 Ridgewood Rd., Niantic, Conn. 06357
Continuation of Ser. No. 144,929, Apr. 29, 1980, abandoned.
This application Jan. 15, 1982, Ser. No. 339,381
Int. Cl.³ A61K 7/18
U.S. Cl. 424—52 20 Claims

1. A method for control of chronic oral mal odors of adult persons of at least 25 years of age and suffering from chronic oral mal odors containing oral generated sulfides, comprising rinsing the oral cavity for a total time period of at least 1 minute per day and wherein each rinse time is at least 0.5 minute with an oral rinse where the active ingredient consists essentially of an aqueous solution of 0.01% to 1.0% of a water-soluble fluoride selected from potassium fluoride and sodium fluoride.

4,430,324
AMMONIUM FLUOROMETALLATE CONTAINING COMPOSITIONS
John P. Viccaro, Whitestone, N.Y., assignor to Lever Brothers Company, New York, N.Y.
Continuation of Ser. No. 325,458, Nov. 27, 1981, abandoned.
This application Sep. 7, 1982, Ser. No. 415,111
Int. Cl.³ A61K 7/18, 7/22, 33/16, 33/30
U.S. Cl. 424—52 22 Claims

1. A composition, comprising:

(i) an amount of ammonium fluorometallate selected from the group consisting of $ZnNH_4F_3$, $CoNH_4F_3$, $CuNH_4F_3$, $Sn(NH_4)_2F_6$, $MnNH_4F_3$, $FeNH_4F_3$, $Zr(NH_4)_3F_7$, $In(NH_4)_3F_6$ and mixtures thereof, effective to treat, control or substantially prevent plaque formation and dental caries; and

(ii) a carrier for said fluorometallate suitable for use in the oral cavity.

4,430,325
TOPICAL TREATMENT OF SKIN LESIONS
Abdul Gaffar, and Calvin B. Davis, both of Somerset, N.J., assignors to Colgate-Palmolive Company, New York, N.Y.
Filed Dec. 23, 1981, Ser. No. 333,587
Int. Cl.³ A61K 33/42
U.S. Cl. 424—128 3 Claims

1. The method of treating skin lesions comprising topically applying a dermatological composition comprising a safe and therapeutically effective amount of a peroxydiphosphate salt to the afflicted situs.

4,430,326
METHOD OF DIMINISHING GLUCOSE LEVELS RESULTING FROM ENDOGENOUS GLUCAGON
Victor J. Hruby, and Marvin D. Bregman, both of Tucson, Ariz., assignors to University Patents, Inc., Norwalk, Conn.
Filed Dec. 22, 1981, Ser. No. 333,376
Int. Cl.³ A61K 37/02
U.S. Cl. 424—177 15 Claims

1. A method of diminishing glucose levels resulting from endogenous glucagon in a mammal, said method comprising parenterally administering a antagonistically effective amount of an analog of glucagon having a positive charge neutralizing, lipophilic and/or steric-hindering substituent on the N^{ϵ} amino group of the lysine-12 residue and either (1n) a positive charge neutralizing, lipophilic and/or steric-hindering substituent on the N^{α} amino group of histidine, or (2) the N^{α} histidine amino group deleted with the addition of a positive charge neutralizing, lipophilic and/or steric-hindering substituent in place thereof, or (3) the N^{α} histidine amino acid residue deleted with the addition of a positive charge neutralizing, lipophilic and/or steric-hindering substituent to the amino group of serine-2.

4,430,327
METHOD FOR TREATING PREGNANT FEMALES FOR PAIN AND ANXIETY
Robert C. A. Frederickson, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.
Filed May 18, 1982, Ser. No. 379,539
Int. Cl.³ A61K 37/02
U.S. Cl. 424—177 8 Claims

1. A method for preventing or minimizing the effects of a drug on an embryo or a fetus by placental transport while alleviating pain and anxiety of the pregnant female during such pregnancy, which comprises administering to said pregnant female a pharmaceutically effective amount of a compound of the formula

H-L-Tyr-D-Ala-Gly-L-Phe-L-(N-CH_3)Met-NH_2

or a pharmaceutically acceptable salt thereof.

4,430,328
RUMINANT LACTATION IMPROVEMENT
Curtis C. Scheifinger, Morristown, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.
Continuation of Ser. No. 255,902, Apr. 20, 1981, abandoned.
This application Jul. 1, 1982, Ser. No. 394,199
Int. Cl.³ A61K 37/00, 35/00
U.S. Cl. 424—177 8 Claims

1. A method for improving milk production in healthy lactating ruminants having a developed rumen function comprising orally administering a propionate increasing amount of a glycopeptide antibiotic.

4,430,329
SYNERGISTIC TREATMENT OF ADULT CANINE HEARTWORM WITH THIACETARSAMIDE AND IVERMECTIN
Lyndia S. Blair, Annandale, N.J., assignor to Merck & Co., Inc., Rahway, N.J.
Filed May 17, 1982, Ser. No. 379,233
Int. Cl.³ A61K 31/71, 31/285
U.S. Cl. 424—181 4 Claims

1. A synergistic method for the elimination of adult canine heartworms (Dirofilaria imitis) from dogs so infected which comprises the intravenous administration to said dogs of about 1 mg per lb. (2.2 mg/kg) of thiacetarsamide followed by the administration either orally or parenterally of from 0.0125 to 5

mg/kg of ivermectin administered at from 3 to 6 weeks after the thiacetarsamide administration in a single dose or multiple doses given at from 1 day to 1 month intervals.

4,430,330

PROCESS AND COMPOSITION FOR TREATING DISORDERS BY ADMINISTERING A PHENOTHIAZINE AND CHOLINE

John H. Growdon, Brookline, and Richard J. Wurtman, Boston, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation of Ser. No. 229,894, Jan. 30, 1981, abandoned, which is a continuation-in-part of Ser. No. 126,124, Feb. 29, 1980, abandoned, which is a continuation-in-part of Ser. No. 88,227, Oct. 25, 1979, abandoned, which is a continuation-in-part of Ser. No. 847,967, Nov. 2, 1977, abandoned. This application Apr. 8, 1982, Ser. No. 366,888

Int. Cl.[3] **A61K** *31/34, 31/685*

U.S. Cl. 424—199 **10 Claims**

1. The process for reducing or eliminating undesirable effects of a drug administered to a human which side effects result from inadequate release of brain acetylcholine, said drug being a thioxanthene, which comprises administering concomitantly with the drug an amount of a compound effective to release adequate amounts of brain acetylcholine selected from the group consisting of choline, a salt of choline, lysolecithin, and acyglycerophosphocholine, glycerophosphatidyl choline and mixtures thereof.

4,430,331

ANTIARRHYTMIC BENZYLIMIDAZOLE

Masaru Ogata, Osaka, Japan, assignor to Shionogi & Co., Ltd., Osaka, Japan

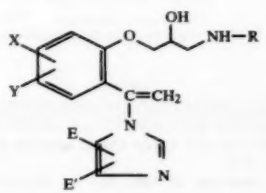
Filed Apr. 29, 1982, Ser. No. 372,951

Claims priority, application Japan, May 14, 1981, 56-72986

Int. Cl.[3] **A61K** *31/415;* **C07D** *233/90, 233/60*

U.S. Cl. 424—273 R **11 Claims**

1. A compound of the formula:



wherein

E and E′ each is hydrogen, C_1–C_2 alkyl or C_2–C_3 alkoxycarbonyl;

R is C_3–C_4 alkyl; and

X and Y each is hydrogen, methyl, methoxy or chlorine; or a pharmaceutically acceptable acid addition salt thereof.

11. A method for treating a patient suffering from arrhythmia which comprises administering to said patient the pharmaceutical composition as claimed in claim 1.

4,430,332

ETHERS OF 1-(2-PROPYNYLOXY)-2-AMINO-3-PROPANOL

Patrick Carlier; Andre J. C. Monteil, both of Chatel-Guyon, and Jacques A. L. Simond, Chamalieres, all of France, assignors to Centre Europeen de Recherches Mauvernay, Riom, France

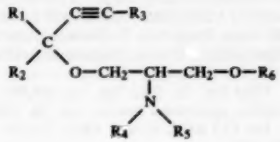
Filed Dec. 19, 1980, Ser. No. 218,176

Claims priority, application France, Dec. 28, 1979, 7932008

Int. Cl.[3] **A61K** *31/535, 31/40;* **C07D** *295/08, 207/04*

U.S. Cl. 424—248.57 **6 Claims**

1. A compound of the formula:



or a pharmaceutically acceptable salt thereof, in which R_1 and R_2 each represent, independently of one another, a C_1–C_6 alkyl radical or a phenyl radical, or, together with the carbon atom to which they are attached, form a cycloalkyl radical having at the most 7 carbon atoms; R_3 represents hydrogen, a C_1–C_6 alkyl radical or the phenyl radical; R_4 and R_5, together with the nitrogen atom to which they are attached, form a pyrrolidinyl or morphilino radical, and R_6 represents a C_1–C_6 alkyl radical, a phenyl radical, a benzyl radical, or the 1-ethynylcyclohexyl radical.

2. Compound according to claim 1, in which R_1 is methyl, R_2 is phenyl, R_3 is hydrogen, R_6 is isobutyl and the group NR_4R_5 is the pyrrolidinyl radical.

3. Compound according to claim 1, in which R_1 and R_2 together with the carbon atom to which they are bound represent the cyclohexyl radical, R_3 is methyl, R_6 is isobutyl and the group NR_4R_5 represents the pyrrolidinyl radical.

4. Compound according to claim 1, in which R_1 is phenyl, R_2 is methyl, R_3 is hydrogen, R_6 is ethyl and the group NR_4R_5 is the morpholino radical.

6. A method of treating patients with angina pectoris wherein a compound according to any one of claims 1, 2, 3 or 4 is administered to said patients at daily doses of between 100 and 600 mg.

4,430,333

DIHYDROPYRIDINE ANTI-ISCHAEMIC AND ANTIHYPERTENSIVE AGENTS

Simon F. Campbell, Deal; Peter E. Cross, Canterbury, and John K. Stubbs, Deal, all of England, assignors to Pfizer Inc., New York, N.Y.

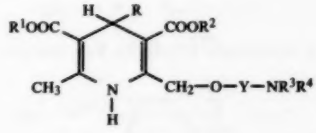
Filed Mar. 11, 1982, Ser. No. 357,229

Claims priority, application United Kingdom, Mar. 14, 1981, 8108088

Int. Cl.[3] **C07D** *213/55;* **A61K** *31/44*

U.S. Cl. 424—266 **10 Claims**

1. A compound of the formula



or a pharmaceutically acceptable acid addition salt thereof, wherein

Y is $—(CH_2)_2—$ or $—(CH_2)_3—$;

R is aryl;

R^1 and R^2 are each independently C_1–C_4 alkyl or 2-methoxyethyl;

and

R^3 and R^4 are each independently C_1–C_4 alkyl or aryl-(C_1–C_4 alkyl);

wherein said aryl is phenyl; phenyl substituted by one or two substituents selected from nitro, halo, C_1–C_4 alkyl, C_1–C_4 alkoxy, trifluoromethyl, and cyano; or is 1- or 2-naphthyl.

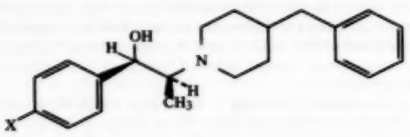
9. A method of treating ischaemia in an animal in need of treatment comprising administering to said animal an effective anti-ischaemic amount of a compound of claim 1.

4,430,334
PHENETHANOLAMINE DERIVATIVES FOR USE AGAINST CEREBROVASCULAR DISEASE

Alexander E. Wick, Saint Nom La Breteche, and Jonathan R. Frost, Cachan, both of France, assignors to Synthelabo, Paris, France

Filed Apr. 13, 1982, Ser. No. 368,002
Claims priority, application France, Apr. 14, 1981, 81 07445
Int. Cl.³ A61K *31/445*; C07D *211/14*
U.S. Cl. 424—267 **8 Claims**

5. A pharmaceutical composition for the treatment of cerebrovascular disease which comprises an effective dose for such treatment of a phenethanolamine derivative in the (±)-erythro form of the formula:



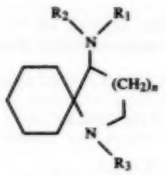
wherein X represents a halogen atom, or a pharmaceutically acceptable acid addition salt thereof, in association with a pharmaceutical excipient suitable for oral or parenteral administration.

4,430,335
SUBSTITUTED 1-AZASPIRO[4,5]DECANES AND THEIR ANALGESIC COMPOSITIONS

Joseph T. Strupczewski, Flemington, N.J., and Beth A. Gardner, San Jose, Calif., assignors to Hoechst-Roussel Pharmaceuticals Inc., Somerville, N.J.

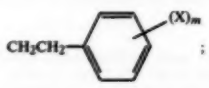
Filed Feb. 9, 1983, Ser. No. 465,146
Int. Cl.³ C07D *221/20*; A61K *31/445*
U.S. Cl. 424—267 **52 Claims**

1. A compound having the formula



wherein R_1 is hydrogen, CO_2R_4, R_4; R_2 is hydrogen,

R_3 is hydrogen, $—CO_2R_5$, R_5,



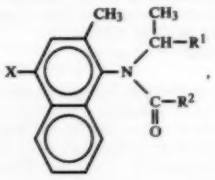
R_4 is alkyl of 1 to 4 carbon atoms; R_5 is alkyl of 1 to 8 carbon atoms; X is halogen, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, CF_3, and OH; m is an integer of 0, 1 or 2, and n is an integer of 1 or 2 or its pharmaceutically acceptable salts thereof.

4,430,336
N-SUBSTITUTED 2-METHYLNAPHTHYLAMIDES, THEIR PREPARATION AND FUNGICIDES CONTAINING THESE COMPOUNDS

Costin Rentzea, Heidelberg; Bernd Zeeh, Ludwigshafen, and Ernst-Heinrich Pommer, Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Nov. 18, 1980, Ser. No. 208,033
Claims priority, application Fed. Rep. of Germany, Dec. 4, 1979, 2948704
Int. Cl.³ A01N *43/80*; C07D *261/14*
U.S. Cl. 424—272 **4 Claims**

1. An N-substituted 2-methylnaphthylamide of the formula



I

where R^1 is

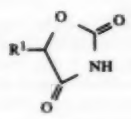
R^3 being hydrogen or C_{1-4}-alkoxy, and R^2 is unsubstituted 3- or 5-isoxazolyl, or mono- or di-substituted 3- or 5-isoxazolyl, wherein the substituents are fluorine, chlorine, bromine, nitro, linear alkyl of 1–4 carbon atoms, methoxy, ethoxy, methylthio, ethylthio, n-propylthio, trichloromethyl, trifluoromethyl, tetrafluoroethoxy, cyano, methoxycarbonyl, acetyl or propionyl, and X is hydrogen, methyl, chlorine or bromine.

4,430,337
ALICYCLIC SUBSTITUTED OXAZOLIDINE-2,4-DIONES HAVING HYPOGLYCEMIC ACTIVITY

Gerald F. Holland, Old Lyme, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed Jun. 23, 1982, Ser. No. 391,220
Int. Cl.³ C07D *263/44*; A61K *31/42*
U.S. Cl. 424—272 **23 Claims**

1. A compound of the formula



or a pharmaceutically-acceptable cationic salt thereof; wherein R^1 is a hydrocarbon radical having a molecular formula which is either C_nH_{2n-3} (having either two carbocyclic rings or one carbocyclic ring and one double bond) or C_nH_{2n-5} (having two carbocyclic rings and one double bond), wherein n is an integer of value 5 to 9, which is further characterized by having within its structure:

(a) at least one of said rings comprising five or more carbon atoms; and

(b) up to one substituent $(C_1–C_3)$alkyl or $(C_1–C_3)$ alkylidene group.

4,430,338
METHOD OF TREATMENT PATIENTS AT RISK OF SUDDEN DEATH

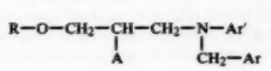
Frans H. J. Jansen, Gud-Turnhout, Belgium, and Peter R. Maroko, Cherry Hill, N.J., assignors to Akzo N.V., Netherlands

Continuation of Ser. No. 192,625, Sep. 30, 1980, abandoned. This application Mar. 17, 1982, Ser. No. 359,133

Int. Cl.³ A61K *31/40, 31/495, 27/00*

U.S. Cl. 424—274 **2 Claims**

1. A method of treating patients at risk of sudden death caused by atherosclerosis or atherothrombosclerosis, characterized by the chronic administration to said patients of a compound of the formula I



I

or a pharmaceutically acceptable acid addition salt thereof, in which R represents isobutyl, Ar and Ar' both are phenyl and A is pyrrolidino in an effective daily dosage from 1–50 mg/kg body weight when administered orally or rectally and from 0.5–25 mg/kg when administered parenterally.

4,430,339
SUBSTITUTED OXIRANECARBOXYLIC ACIDS, THEIR PREPARATION AND THEIR USE AS MEDICAMENTS

Klaus Eistetter, Konstanz, and Erich Rapp, Radolfzell, both of Fed. Rep. of Germany, assignors to Byk Gulden Lomberg Chemische Fabrik Gesellschaft mit beschränkter Haftung, Konstanz, Fed. Rep. of Germany

PCT No. PCT/EP81/00137, § 371 Date Apr. 6, 1982, § 102(e) Date Apr. 6, 1982, PCT Pub. No. WO82/00822, PCT Pub. Date Mar. 18, 1982

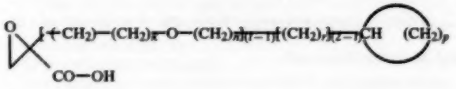
PCT Filed Aug. 24, 1981, Ser. No. 371,294

Claims priority, application Fed. Rep. of Germany, Aug. 29, 1980, 3032668; Switzerland, Feb. 25, 1981, 1243/81

Int. Cl.³ C07D *303/48*

U.S. Cl. 424—278 **13 Claims**

1. An epoxycycloalkylalkanecarboxylic acid of the formula



wherein

k is an integer from 1 to 5, inclusive,

n is an integer from 0 to 6, inclusive,

p is an integer from 2 to 11, inclusive,

t is a positive whole number of at most 2,

r is an integer from 1 to 13, inclusive,

a lower alkyl ester of the carboxylic acid or a salt of said carboxylic acid; the sum of k, n and p being an integer of from 5 to 14, and the sum of r and p being an integer of from 7 to 16.

4,430,340
STABILIZATION OF PGI_2 COMPOUNDS WITH SURFACTANTS

Moo J. Cho, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Jul. 17, 1978, Ser. No. 925,013

Int. Cl.³ A61K *31/34*

U.S. Cl. 424—285 **1 Claim**

1. A pharmaceutical composition, suitable for parenteral administration, which comprises:

(1) a quantity of water;

(2) an amount of hexodecyltrimethylammonium chloride (CTAC); which, when mixed with said quantity of water, is present therein in a stabilizing, pharmaceutically acceptable concentration; and

(3) an amount of prostacyclin sodium salt; which, when mixed with said quantity of water, is present therein at a concentration acceptable for pharmaceutical administration.

4,430,341
WATER SOLUBLE PESTICIDAL QUATERNARY AMMONIUM SALT COMPOUNDS

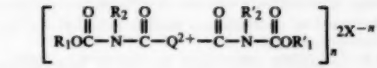
Barbara W. Kaplan, South Charleston, W. Va., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Aug. 24, 1977, Ser. No. 827,263

Int. Cl.³ A01N *43/48;* **C07C** *125/04*

U.S. Cl. 424—250 **40 Claims**

1. A compound of the formula:



wherein:

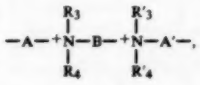
n is 1, 2 or 3;

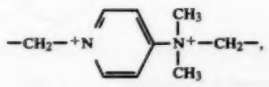
R_1 and R'_1 are the same or different and are benzofuranyl, benzodioxanyl, benzothienyl, 1-naphthyl, dihydrobenzothienyl, 1-tetrahydronaphthyl, benzodioxanyl or dihydrobenzofuranyl all of which may be either unsubstituted or substituted with one or more alkyl groups having from 1 to 8 carbon atoms;

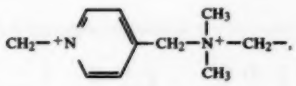
R_2 and R'_2 are the same or different and are alkyl having from 1 to 8 carbon atoms;

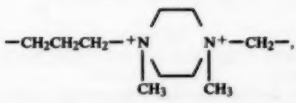
X is a quaternising anion selected from the group consisting of mono-valent, divalent or trivalent inorganic or organic anion whose charge equal n;

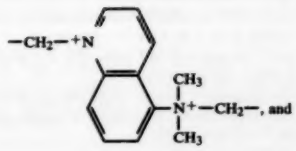
Q^2+ is an organic radical which contains two quaternary nitrogen moieties selected from the group consisting of:



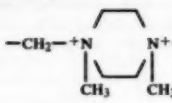








-continued



wherein:

A and A′ are the same or different and are divalent straight or branch chain alkylene or alkenylene having from 1 to 25 carbon atons;

B is a divalent straight or branched chain alkylene or alkenylene which may include one divalent oxygen, sulfur, sulfinyl, sulfonyl, carbonyl or carbonyloxy group;

R_3, R'_3, R_4 and R'_4 are:

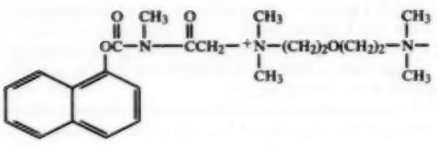
(a) individually, either substituted or unsubstituted alkyl, alkenyl or alkynyl; or

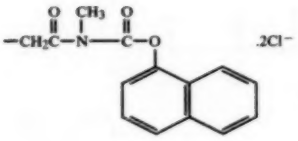
(b) when R_3 and R'_3 are the same or different and are methyl or ethyl, R_4 and R'_4 are the same or different and are either a substituted or unsubstituted phenyl, naphthyl, cycloalkyl, or cycloalkenyl;

wherein the permissible substituents are one or more alkoxy, alkanoyloxy, alkoxycarbonyl, cyano, halo, nitro dialkylamino or alkanoyl groups.

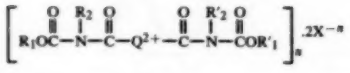
2. A compound according to claim 1 wherein B is a linear or branched alkylene chain having from 1 to 25 carbon atoms which may include one divalent oxygen.

11. A compound of the formula:





31. A compound of the formula:



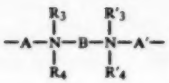
n is 1, 2 or 3;

R_1 and R'_1 are the same or different and are individually 1-naphthyl or 1-tetrahydronaphthyl all of which may be eight unsubstituted or substituted with one or more alkyl groups having from 1 to 8 carbon atoms;

R_2 and R'_2 are the same or different and are alkyl having from 1 to eight carbon atoms;

X is a quaternising anion selected from the group consisting of mono-valent, divalent or trivalent inorganic or organic anions whose charge equals n;

Q^+ is an organic radical of the formula:



wherein:

A and A′ are the same or different and are linear or branched alkylene or alkenylene chains having from 1 to 25 carbon atoms;

B is a linear or branched alkylene chain having from 1 to 25 carbon atoms which may include one divalent oxygen, sulfur, sulfinyl, sulfonyl, carbonyl or carbonyloxy group;

R_3, R'_3, R_4 and R'_4 are individually either substituted or unsubstituted alkyl, alkenyl or alkynyl wherein the permissible substituents are alkoxy, alkanoyloxy, alkoxycarbonyl, cyano, halo, nitro, dialkylamino or alkanoyl.

4,430,342

N-ACYL-3-[4-(BENZOYLALKYL)PIPERAZIN-1-YL]-SYDNONIMINE COMPOUND, PROCESS FOR PRODCTION THEREOF, AND USE THEREOF

Hiroyoshi Hidaka, 799-75, Kannonji-cho, Tsu-shi, Mie-ken; Ikuo Matsumoto, Tokyo; Junji Yoshizawa, Machida, and Shigenori Kotani, Kodaira, all of Japan, assignors to Hiroyoshi Hidaka, Mie, Japan

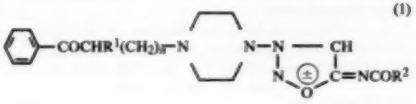
Filed Sep. 21, 1982, Ser. No. 420,873

Claims priority, application Japan, Oct. 6, 1981, 56-158100

Int. Cl.³ C07D *413/04;* **A61K** *31/495*

U.S. Cl. 424—250 **8 Claims**

1. An N-acyl-3-[4-(benzoylalkyl)piperazin-1-yl]-sydnonimine compound represented by the following formula



(1)

wherein R^1 represents a hydrogen atom or an alkyl group having 1 to 8 carbon atoms,

R^2 represents a lower alkyl group, a lower alkoxy group or a phenyl group, and n represents zero or an integer of 1 to 10,

and its acid addition salt.

4,430,343

BENZIMIDAZOLE DERIVATIVES, PROCESS FOR THE PREPARATION THEREOF AND PHARMACEUTICAL COMPOSITION CONTAINING THE SAME

Ryuichi Iemura, Kawanisi; Tsuneo Kawashima, Kobe; Toshikazu Fukuda, Osaka; Keizo Ito, Osaka; Takashi Nose, Nara, and Goro Tsukamoto, Toyonaka, all of Japan, assignors to Kanebo, Ltd., Tokyo, Japan

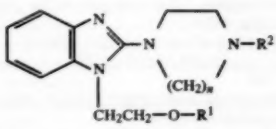
Filed Oct. 22, 1982, Ser. No. 436,032

Claims priority, application Japan, Nov. 6, 1981, 56-178804

Int. Cl.³ A61K *31/495, 31/55;* **C07D** *403/02*

U.S. Cl. 424—250 **10 Claims**

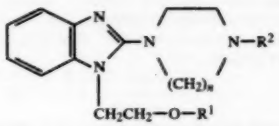
1. A benzimidazole derivative of the formula:



wherein R^1 is an alkyl group having 1 to 3 carbon atoms, allyl group, propargyl group, or phenyl group; R^2 is hydrogen atom

or an alkyl group having 1 to 3 carbon atoms; and n is 2 or 3, or a pharmaceutically acceptable acid addition salt thereof.

6. An antihistaminic composition, which comprises an effective amount of a benzimidazole derivative of the formula:



wherein R^1 is an alkyl group having 1 to 3 carbon atoms, allyl group, propargyl group, or phenyl group; R^2 is hydrogen atom or an alkyl group having 1 to 3 carbon atoms; and n is 2 or 3, or a pharmaceutically acceptable acid addition salt thereof as an active ingredient in admixture with a conventional pharmaceutically acceptable carrier or diluent.

4,430,344
ANTIHYPERTENSIVE 4-THIAZOLIDINECARBOXYLIC ACIDS

Junichi Iwao, Takarazuka; Masayuki Oya, Osaka; Toshio Baba, Suita; Tadashi Iso, Tondabayashi, and Takehisa Chiba, Kyoto, all of Japan, assignors to Santen Pharmaceutical Co., Ltd., Osaka, Japan

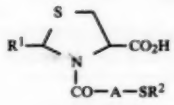
Filed Mar. 23, 1979, Ser. No. 23,397

Claims priority, application Japan, Apr. 8, 1978, 53-41632; Apr. 25, 1978, 53-49657; Jul. 3, 1978, 53-81116

Int. Cl.³ C07D *277/04;* **A61K** *31/425*

U.S. Cl. 424—270 **37 Claims**

1. A compound of the formula



(I)

wherein

R^1 is phenyl substituted by at least one substituent selected from the group consisting of hydroxy, lower alkanoyloxy containing 1 to 6 carbon atoms, benzoyloxy, and benzyloxycarbonyloxy;

R^2 is hydrogen or benzoyl;

A is straight or branched alkylene with 1 to 3 carbon atoms; and pharmaceutically acceptable salts thereof.

4,430,345
PROSTAGLANDINS

Robert L. Jones, and Norman H. Wilson, both of Edinburgh, Scotland, assignors to National Research Development Corporation, London, England

Division of Ser. No. 205,964, Sep. 3, 1980, Pat. No. 4,368,332. This application Sep. 30, 1982, Ser. No. 431,554

Claims priority, application United Kingdom, Jan. 5, 1979, 7900368

Int. Cl.³ C07C *131/02;* **A61K** *31/19;* **C07C** *131/08*

U.S. Cl. 424—305 **35 Claims**

1. A compound which is a bicyclo[2,2,1]heptane or hept-2Z-ene which is substituted at the 5-position by a group of the formula $—R^1—COQ$, where

R^1 is selected from the group consisting of C_4–C_8 alkyl;

$—CH_2—CH=CH—(CH_2)_m—$, where m is an integer from 1 to 5;

$—CH_2—CH_2—CH=CH—(CH_2)_n$, where n is an integer from 0 to 4;

$—X—(CH_2)_p—$, where p is an integer from 3 to 7;

$—CH_2—X—(CH_2)_q—$, where q is an integer from 2 to 6;

$—CH_2—CH_2—X—(CH_2)_m—$; and $—CH=CH—(CH_2)_3—$; wherein X is O or S;

COQ is carboxy, a physiologically acceptable carboxylate salt, a branched or unbranched C_1–C_5 alkyl ester of $CONHSO_2CH_3$;

and wherein said bicyclo[2,2,1]heptane or hept-2Z-ene is substituted at the 6-position by a grouping of the formula:

$—C(R)=NO—R'$;

wherein

R is selected from the group consisting of hydrogen, unsubstituted C_1–C_{10} branched or unbranched aliphatic hydrocarbon residues and C_1–C_{10} aliphatic hydrocarbon residues substituted by Ar, —OAr or —SAr, where Ar represents a monocyclic aromatic hydrocarbon or pyridyl residue, or such a residue substituted by one or more substituents selected from the group consisting of halogen, halogen substituted branched or unbranched C_1–C_5 alkyl groups, sulphonamido groups, amino groups, hydroxy and C_1–C_{10} alkoxy; and

R′ is selected from the group consisting of unsubstituted C_1–C_{10} branched or unbranched aliphatic hydrocarbon residues, Ar and C_1–C_{10} branched or unbranched aliphatic hydrocarbon residues substituted by Ar, —OAr, or —SAr.

4,430,346
NOVEL CARCINOSTATIC SUBSTANCE AND PROCESS FOR SYNTHESIS THEREOF

Hamao Umezawa; Tomio Takeuchi, both of Tokyo; Shinichi Kondo, Yokohama; Hironobu Iinuma; Daishiro Ikeda, both of Tokyo; Teruya Nakamura, Kusatsu, and Akio Fujii, Kamakura, all of Japan, assignors to Bristol-Myers Company, New York, N.Y.

Filed May 7, 1982, Ser. No. 375,950

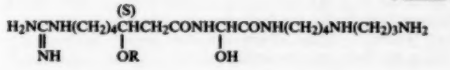
Claims priority, application Japan, May 11, 1981, 56-69340

Int. Cl.³ C07C *129/12;* **A61K** *37/02*

U.S. Cl. 424—311 **15 Claims**

1. A composition selected from the group consisting of the epimeric mixture at position 2 of substances of Formula I, and the acid addition salts thereof

Formula I



wherein R is hydrogen, alkanoyl of 1 to 14 carbon atoms, or benzoyl.

4,430,347
CYSTAMINE DERIVATIVES SUITABLE FOR USE AS MEDICAMENTS

Joël Oiry, 31, Lotissement Chateaubon Route de laverune, 34100 Montpellier, and Jean-Louis Imbach, Chemin du Clos des Oliviers 1108 rue de las Sordes, 34000 Montpellier, both of France

Continuation of Ser. No. 160,183, Jun. 17, 1980, Pat. No. 1,314,076. This application Apr. 15, 1981, Ser. No. 254,498

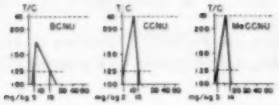
Claims priority, application France, Jun. 19, 1979, 79 15672

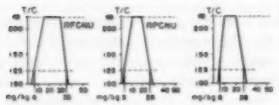
Int. Cl.³ A61K *31/17;* **C07C** *127/15*

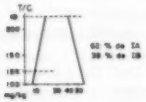
U.S. Cl. 424—322 **10 Claims**

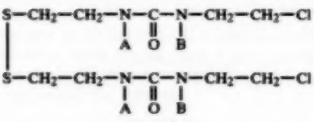
1. A pharmaceutical composition, useful for treating tumors

which composition comprises at least one compound of the formula









in which one of the substituents A and B is hydrogen and the other the radical —N=O, in an amount effective to inhibit tumor growth, in combination with a pharmaceutically acceptable vehicle.

4,430,348

IMMOBILIZED GLUCOAMYLASE REACTOR FOR PREPARING A LOW CALORIE BEER

George R. Duncombe, Grafton; William F. Line, West Allis, and Etzer Chicoye, Wauwatosa, all of Wis., assignors to Miller Brewing Company, Milwaukee, Wis.

Continuation-in-part of Ser. No. 116,377, Jan. 29, 1980, abandoned, and Ser. No. 253,468, Apr. 13, 1981, abandoned. This application Nov. 12, 1982, Ser. No. 441,258

Int. Cl.³ C12C *11/04;* C12N *11/14;* C12M *1/40*

U.S. Cl. 426—13 5 Claims

1. In the method of preparing a superattenuated low calorie beer by hydrolyzing the limit dextrins in beer with glucoamylase, the improvement which comprises passing the beer containing the limit dextrins during primary fermentation through a ceramic monolith having a plurality of open ended passages ranging from 50 to 3,000 microns in diameter extending therethrough to permit the rapid, sustained, unobstructed flow of a fermenting beer stream containing yeast and other suspended solids, said passages having surfaces to which glucoamylase has been covalently attached to form an immobilized glucoamylase reactor, which reactor effectively hydrolyzes the limit dextrins in the beer with which it comes in contact without releasing the attached enzyme.

4,430,349

ARTIFICIALLY SWEETENED GELLED YOGURT

Michael J. Malone, and Evelyn A. Miles, both of Houston, Tex., assignors to The Coca-Cola Company, Atlanta, Ga.

Filed Dec. 23, 1982, Ser. No. 452,636

Int. Cl.³ A23C *9/13, 9/137;* A23L *1/236*

U.S. Cl. 426—34 11 Claims

1. A method for preparing a gelled, sweetened yogurt comprising the steps of:

combining in the presence of water a mixture comprising (a) an amount of high methoxyl pectin effective to inhibit protein precipitation in a yogurt, (b) an amount of low methoxyl pectin effective to gel a yogurt, and (c) an effective amount of a sweetener comprising an aspartic acid-derived sweetener; to yield a sweetened stabilizing solution;

pasteurizing said sweetened stabilizing solution to yield a pasteurized sweetened stabilizing solution; and

mixing said pasteurized sweetened stabilizing solution with prepared yogurt.

4,430,350

COMPOSITE ICE CONFECTIONS AND PROCESSES FOR PREPARING THEM

David Tresser, Bedford, England, assignor to Thomas J. Lipton, Inc., Englewood Cliffs, N.J.

Continuation of Ser. No. 244,794, Mar. 17, 1981, abandoned. This application May 10, 1982, Ser. No. 376,633

Claims priority, application United Kingdom, Jul. 20, 1979, 7925402; Jul. 20, 1979, 7925446; Jul. 20, 1979, 7925447

Int. Cl.³ A23G *9/04, 9/24*

U.S. Cl. 426—101 9 Claims

1. A composite frozen confection comprising an ice confection in contact with a layer of fat-based confectionery composition comprising a suspension of sweetening and flavoring solids in an edible fat, wherein the edible fat includes a fat composition which is an interesterified mixture of about 75% to 90% of a lauric acid or oil and about 10% to 25% of a non-lauric oil having

(a) solids content index (SCI) values (%) in each of the following ranges:

70–93 at −20° C.;

65–93 at −10° C.;

55–90 at 0° C.;

15–40 at 20° C.;

0–12 at 30° C.; and

0 at 35° C.;

(b) slip melting point in the range 23°–32° C., and

(c) a brittleness time of at least 45 seconds.

4,430,351

CONFECTIONARY PRODUCT WITH A FILLING

Lorenzo Cillario, Alba, Italy, assignor to Ferrero S.p.A., Alba, Italy

Filed Apr. 13, 1982, Ser. No. 367,947

Claims priority, application Italy, Apr. 24, 1981, 67561 A/81

Int. Cl.³ A23G *3/00*

U.S. Cl. 426—103 12 Claims

1. A confectionary product comprising an edible water-impermeable capsule bonded on its outer surface to the internal surface of a pair of edible wafer shell halves, said shell halves jointly forming a closed shell around said capsule, said capsule functioning to assist in holding said shell halves together, and said capsule containing an edible filling having a water content which would be detrimental to said wafer shell under conditions of direct contact between said filling and said wafer shell, said capsule preventing contact between said filling and said wafer shell.

4,430,352

PREPARATION OF FRESH CHOPPED ONIONS WHICH MAY BE DISPENSED FROM TUBES

Hermann Postner, Ludwigsburg, Fed. Rep. of Germany, assignor to Societe d'Assistance Technique pour Produits Nestle S.A., Lausanne, Switzerland

Filed May 12, 1982, Ser. No. 377,433

Claims priority, application Fed. Rep. of Germany, May 12, 1981, 3118810

Int. Cl.³ A23L *1/212;* B65B *55/04*

U.S. Cl. 426—115 5 Claims

1. A preparation of fresh, chopped onions which may be dispensed from tubes, containing

(a) from 88 to 92% of raw onion cubes having an edge length from 3 to 6 mm,
(b) from 0.05 to 0.1% of sodium metabisulphite,
(c) from 0.1 to 0.5% of tartaric acid and/or citric acid,
(d) from 0.05 to 0.2% ascorbic acid,
(e) from 0.05 to 0.2% of swelling agent,
(f) about 1% of common salt
(g) from 3 to 5% of sugar or a sugar alcohol,
(h) from 3 to 5% of vegetable oil and
(i) from 0.05 to 0.15% of emulsifying agent.

4,430,353

LOW-GRADE COFFEE

Slawko Yadlowsky, Manville, N.J., assignor to General Foods Corporation, White Plains, N.Y.

Filed Nov. 8, 1982, Ser. No. 439,966
Int. Cl.³ A23F 5/16
U.S. Cl. 426—388 **5 Claims**

1. A method of lessening the off-flavor notes of roasted low-grade coffee which comprises:
(a) contacting low-grade green coffee with a fatty material at a temperature between about 80° C. and 116° C. for a period of time between about 15 min. and 60 min.;
(b) separating the low-grade green coffee of (a) from the fatty material;
(c) removing residual fatty material from the green coffee of step (b) by rinsing said coffee with acetone, separating said coffee from acetone and drying the green coffee prior to roasting; and
(d) roasting the low-grade coffee of step (c).

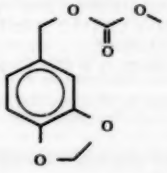
4,430,354

FLAVORING WITH HELIOTROPYL METHYL CARBONATE

Richard M. Boden, Ocean; Theodore J. Tyszkiewicz, Sayreville; Michael Licciardello, Farmingdale; Manfred H. Vock, Locust; Joaquin F. Vinals, Rumson; Patrick Whalen, Matawan, and Marie R. Hanna, Hazlet, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 384,924, Jun. 4, 1983. This application May 20, 1983, Ser. No. 496,648
Int. Cl.³ A23L 1/226
U.S. Cl. 426—536 **1 Claim**

1. A process for augmenting or enhancing the aroma or taste of a foodstuff comprising the step of adding to said foodstuff from 0.1 parts per million up to about 20 parts per million based on the total weight of said foodstuff of heliotropyl methyl carbonate having the structure



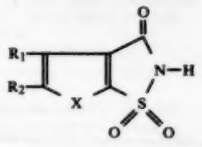
4,430,355

CONDENSED ISOTHIAZOLO-3 (2H)-ONE-1-1-DIOXIDES

Günter Trummlitz; Ernst Seeger, and Wolfhard Engel, all of Biberach, Fed. Rep. of Germany, assignors to Dr. Karl Thomae Gesellschaft mit beschränkter Haftung, Biberach, Fed. Rep. of Germany

Continuation of Ser. No. 107,266, Dec. 26, 1979, abandoned, which is a division of Ser. No. 952,958, Oct. 10, 1978, Pat. No. 4,233,333. This application Aug. 27, 1981, Ser. No. 297,004
Claims priority, application Fed. Rep. of Germany, Nov. 5, 1977, 2749640; Sep. 9, 1978, 2839266
The portion of the term of this patent subsequent to Nov. 11, 1997, has been disclaimed.
Int. Cl.³ C07D 275/06; A23L 1/236
U.S. Cl. 426—548 **4 Claims**

1. A compound of the formula



wherein
X is oxygen or sulfur;
R_1 is hydrogen, methyl or ethyl; and
R_2 is methyl or ethyl;
provided, however, that when X is sulfur R_1 and R_2 are other than both methyl; or a non-toxic salt thereof formed with an inorganic or organic base.

4,430,356

METHOD FOR PRODUCTION OF FORMED FOOD PRODUCT OF MICROFIBRILLAR MILK PROTEIN

Shuzo Ohyabu; Syuji Kawai, and Keiji Matsumura, all of Kurashiki, Japan, assignors to Kuraray Company, Ltd., Kurashiki, Japan

Filed Apr. 8, 1982, Ser. No. 366,731
Claims priority, application Japan, Apr. 13, 1981, 56-56166; Aug. 10, 1981, 56-125777
Int. Cl.³ A23J 3/00
U.S. Cl. 426—574 **13 Claims**

1. A method for the production of a formed food product of a microfibrillar milk protein, which comprises mixing an aqueous gel of a latently microfibrillar milk protein comprising mainly calcium caseinate with a dehydrating agent and a dispersant in an amount of 0.5×10^{-3} to 5.5×10^{-3} mol and 0.05 to 0.6 g, respectively, each per 1 g of the aqueous gel of a milk protein having a water content of 65% by weight at a temperature of 40° to 120° C., and forming the mixture at the same temperature range to obtain a product having microfibrillar structure.

4,430,357

METHOD OF CLEANING GRAIN

Alfred Batscheider, Casa Maralba, 6948 Porza S. Lugano, Switzerland, and G. Bernasek, Im Winkel 11, 3400 Göttingen, Fed. Rep. of Germany

Continuation of Ser. No. 223,299, Jan. 8, 1981, abandoned. This application Nov. 22, 1982, Ser. No. 443,746
Claims priority, application Fed. Rep. of Germany, Dec. 29, 1979, 2952708
Int. Cl.³ A23L 1/20; A23N 12/00
U.S. Cl. 426—626 **2 Claims**

1. Method of cleaning grain, comprising the steps of washing the grain for 8–10 minutes with water-containing washing liquid wherein 1.2 grams of calcium hydroxide per each liter of water is used in said washing liquid whereby the washing liquid becomes saturated with calcium hydroxide so that the

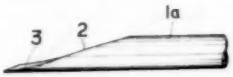
pericarp becomes chemically solidified and at the same time substantially more elastic and the grain has an increase in its weight of approximately 4% by adsorption of the washing liquid; neutralizing the calcium hydroxide by addition thereto after the washing of carbon dioxide so as to convert it into calcium carbonate and thereby depositing a portion of the calcium carbonate in the hypodermis of the grain; and thereafter mechanically removing the two outermost layers of the four-layer pericarp of the grain.

4,430,358

METHOD OF MANUFACTURING A CUT TUBE TO BE USED FOR SYRINGE NEEDLES

Shoji Wada, 11-22, Katase Kaigan 2-chome, Fujisawa-shi, Kanagawa-ken, Japan

Filed Dec. 4, 1981, Ser. No. 327,737
Claims priority, application Japan, Dec. 18, 1980, 55-178022
Int. Cl.³ B65B *33/00*
U.S. Cl. 427—2 **4 Claims**



1. A method of manufacturing a syringe needle which comprises the following steps:

(a) spreading a resin solution at ambient temperatures or under heating over the entire surface inside and outside, of a cut stainless steel tube having a diameter and length conforming to the standard requirements for producing a syringe needle;

(b) hardening the resin spread over said cut tube by leaving it at ambient temperature and/or by heating the resin coated tube, thereby forming a film of hardened resin on the entire inner and outer surface of said cut tube;

(c) removing said film of hardened resin from the outside surface of said cut tube;

(d) grinding the one end of the tube with a grinder at specified angles to form a main bevel;

(e) changing the contact angle between the grinder and the cut tube to guide both sides of the main bevel to form side bevels thereby producing a syringe needle tube having a piercing point at the ground edge of said tube; and

(f) washing and drying the syringe needle tube.

4,430,359

PROCESS FOR COATING OBJECTS ELECTROSTATICALLY

Roland A. Meisner, Schorndorf, Fed. Rep. of Germany, assignor to BASF Farben + Fasern AG, Hamburg, Fed. Rep. of Germany

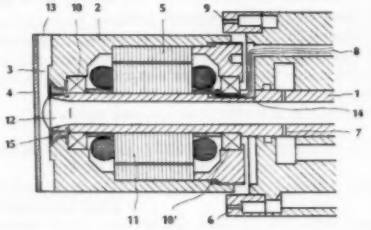
Division of Ser. No. 234,193, Feb. 13, 1981, abandoned. This application Jul. 2, 1982, Ser. No. 394,679
Claims priority, application Fed. Rep. of Germany, Feb. 15, 1980, 3005678
Int. Cl.³ B05D *1/06*
U.S. Cl. 427—31 **1 Claim**

1. In the process for electrostatically coating objects with electrostatically charged powder grains by supplying a mixture of powder and air to a spray bell, fanning out the powder particles and centrifuging the powder particles off of the spray bell, conveying the powder particles onto the object to be treated by applying an electric field between the spray bell and the object,

the improvement comprising supplying a flow of powder in the fluidized state and at a low speed, centrally to the spray bell,

implementing the supply of the fluidized powder flow by suction from the spray bell,

controlling a partial vacuum produced by the bell by blowing air into a supply path of the mixture of powder and air, and accelerating the mixture of powder and air together with the bell to 500 to 6,000 rpm, whereby said mixture



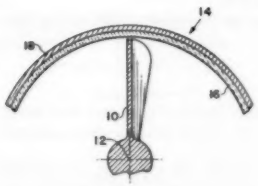
moves to the rim of the bell and is flung off by centrifugal force.

4,430,360

METHOD OF FABRICATING AN ABRADABLE GAS PATH SEAL

Robert C. Bill, Rocky River, and Donald W. Wisander, Columbia Station, both of Ohio, assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Division of Ser. No. 242,795, Mar. 11, 1981, Pat. No. 4,377,371. This application Sep. 30, 1982, Ser. No. 431,448
Int. Cl.³ B05D *1/08*
U.S. Cl. 427—34 **9 Claims**



1. A method of fabricating an abradable gas path seal between the tips of a plurality of blades rotating about an axis and an annular substrate forming a shroud concentric with said axis in spaced relationship with said blade tips comprising the steps of

plasma spraying a coating of a ceramic material onto the surface of said annular substrate facing said rotating blades, and

forming a fine microcrack network in the surface of said ceramic coating for precluding the formation of a catastrophic crack during thermal shock exposure.

4,430,361

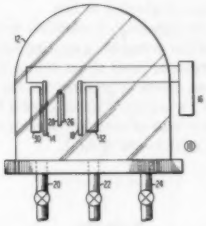
APPARATUS AND METHOD FOR PREPARING AN ABRASIVE COATED SUBSTRATE

John W. Robinson, Levittown, Pa., and Grzegorz Kaganowicz, Belle Mead, N.J., assignors to RCA Corporation, New York, N.Y.

Filed Feb. 2, 1983, Ser. No. 463,288
Int. Cl.³ B05D *3/06*
U.S. Cl. 427—39 **7 Claims**

1. In a method for preparing a coating in a magnetically enhanced glow discharge apparatus, comprising subjecting

gaseous precursors to a glow discharge and depositing the coating onto a substrate;



the improvement comprising mounting said substrate onto a ferromagnetic backing plate whereby the rate of deposition of said coating in the electrode area is increased.

4,430,362

PRODUCTION OF MAGNETIC RECORDING MEDIA

Milena Melzer, Ludwigshafen; Norbert Schneider, Altrip; Helmut Kopke, Weisenheim; Klaus Schoettle, Heidelberg; Eberhard Koester, Frankenthal; Werner Balz, Limburgerhof, and Werner Grau, Bobenheim-Roxheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 16, 1982, Ser. No. 450,490

Claims priority, application Fed. Rep. of Germany, Dec. 28, 1981, 3151590

Int. Cl.³ H01F *10/02*

U.S. Cl. 427—48 **3 Claims**

1. A process for the production of a magnetic recording medium by dispersing a finely divided magnetically anisotropic material in a solution of a film-forming binder mixture and, if desired, a further polymeric binder, in an organic solvent, with the addition of conventional assistants, applying a layer of the fluid dispersion to a non-magnetic base, orienting the magnetic particles by means of a magnetic field, crosslinking the binder components and drying the resulting layer, wherein the film-forming binder mixture comprises

(A) from 60 to 90 percent by weight of a polyurethane binder, obtained from a straight-chain or branched polyester containing 0.5–8% of hydroxyl groups and a di- or polyisocyanate, and

(B) from 10 to 40 percent by weight of a thermoplastic hydroxyl-containing phenoxy resin having a molecular weight of from 10,000 to 50,000,

with the proviso that the di- or polyisocyanate is added, in an amount of from 0.6 to 1.3 equivalents, based on one equivalent of hydroxyl groups of the polyester, only after the magnetically anisotropic material has been dispersed in components (A) and/or (B).

4,430,363

PROCESS OF MAKING INFORMATION CARRYING SYSTEMS

Michael P. Daniels, Hastings, and Robert J. Schoonover, Afton, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Dec. 10, 1982, Ser. No. 448,618

Int. Cl.³ B05D *3/06*

U.S. Cl. 427—54.1 **14 Claims**

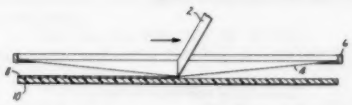
1. A process for producing an information carrying article comprising:

(a) providing a fluid polymerizable composition onto one face of a screen having between 50 and 450 mesh,

(b) passing the fluid polymerizable composition through said screen and onto at least one surface of a substrate,

(c) confining said polymerizable composition between said at least one surface and at least one information coded surface,

(d) polymerizing said polymerizable composition while it is being confined, and



(e) removing said at least one information coded surface from the polymerized composition to leave a replicated coded surface structure on the polymerized composition.

4,430,364

METHOD FOR FORMING AN ALUMINUM METALLIC THIN FILM BY VAPOR PHASE GROWTH ON A SEMICONDUCTOR SUBSTRATE

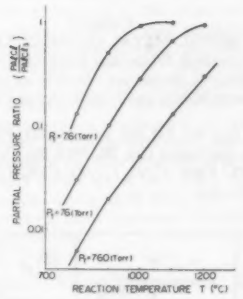
Takashi Ito, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Mar. 22, 1982, Ser. No. 360,661

Claims priority, application Japan, Mar. 23, 1981, 56-42209

Int. Cl.³ H01L *21/285*

U.S. Cl. 427—91 **9 Claims**



1. A method for forming an aluminum thin film by vapor phase growth on a semiconductor substrate having a step, comprising the steps of:

decomposing a monovalent aluminum halide into a trivalent aluminum halide and metallic aluminum; and

depositing said metallic aluminum on said semiconductor substrate which is maintained at a temperature lower than the melting point of said metallic aluminum and forming a substantially uniform aluminum thin film thereon which covers said step without breaks.

4,430,365

METHOD FOR FORMING CONDUCTIVE LINES AND VIAS

Paul M. Schaible, Poughkeepsie, N.Y., and John Suierveld, San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 22, 1982, Ser. No. 400,800

Int. Cl.³ H01L *27/10*

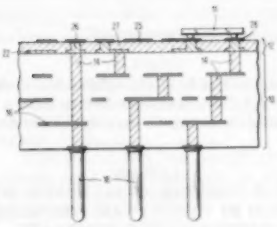
U.S. Cl. 427—96 **4 Claims**

1. A method of fabricating on a multilayer interconnection ceramic body a metallurgical interconnection package for interconnection of a plurality of large scale integrated circuit semiconductor chips said ceramic body including an interconnection pattern and vias therein, the vias extending from said interconnection pattern and forming a planar surface with said ceramic body, said method comprising the steps of:

depositing a blanket layer of conductive material on said planar surface;

delineating said layer of conductive material into a circuit pattern connected to said vias;

forming a mask which is resistive to reactive ion etching on the surface of said circuit pattern to define the area where the via studs are to be formed;



subjecting to reactive ion etching unmasked areas of said circuit pattern to reduce the thickness of the circuit pattern and to form via studs;

forming a dielectric material on said ceramic body;

whereby said circuit pattern and via studs are formed as an integral structure from said blanket layer.

4,430,366

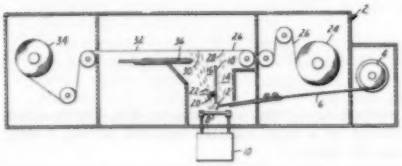
METAL/METAL OXIDE COATING

George H. Crawford, White Bear Lake; Edward J. Downing, St. Paul, and Roy G. Schlemmer, Oakdale, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 231,500, Feb. 4, 1981, Pat. No. 4,364,995. This application Oct. 20, 1982, Ser. No. 435,489

Int. Cl.³ C03C *17/09, 17/245;* **C23C** *13/02, 13/04*

U.S. Cl. 427—162 **8 Claims**



1. A process for continuously depositing a layer having a composition of at least two components of metal and metal oxide and/or metal sulfide upon a moving substrate which process comprises applying onto at least one surface of said substrate the components of said layer from a metal vapor stream into which stream is introduced at least one substance from the group consisting of oxygen, water, sulfur, or hydrogen sulfide, and controlling the amount of oxygen, water, sulfur, or hydrogen sulfide introduced into different regions of said metal vapor stream as the surface to be coated is moved so as to coat the substrate with a layer having varying compositions of said at least two components.

4,430,367

TRANSLUCENT STAINABLE COATING

Geronimo E. Lat, Skokie, Ill., assignor to United States Gypsum Company, Chicago, Ill.

Continuation-in-part of Ser. No. 338,770, Jan. 11, 1982, abandoned. This application Jun. 15, 1983, Ser. No. 504,077

Int. Cl.³ C08K *3/26, 3/32*

U.S. Cl. 427—388.4 **17 Claims**

1. An aqueous composition for forming a translucent, stain absorbent film, said composition comprising an acrylic latex containing from about 8% to about 15% of an acrylic resin based on the total weight of the composition, and from about 11% to about 50% of a water-insoluble extender pigment having a mean particle size of from about 5 to about 7 microns and a Moh hardness of about 4 or less.

15. A method for imparting stainability to a non-absorbent substrate, said method comprising coating said substrate with an aqueous dispersion of from about 8% to about 15% of an acrylic resin and an extender pigment having a mean particle size of from about 5 to about 7 microns and a Moh hardness of about 4 or less, the ratio of extender pigment to acrylic resin being from about 1.5:1 to about 3.6:1.

4,430,368

WATER REDUCIBLE MODIFIED POLYESTER RESIN

Barbara R. Garland, Elizabeth Township, Allegheny County, and Mark D. Troutman, Greensburg, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 7, 1982, Ser. No. 415,097

Int. Cl.³ B05D *3/02*

U.S. Cl. 427—385.5 **6 Claims**

1. In a water reducible modified polyester resin which contains a melamine resin, the improvement which comprises including in said resin about 20 to about 50% by weight, based on total solids weight of said water reducible resin, of a mixture of water soluble hexamethoxymethyl melamine and water soluble methylated melamine formaldehyde in a weight ratio of about 1 to 1.

4,430,369

SILICA SOL PENETRATION AND SATURATION OF THERMAL INSULATION FIBERS

Charles C. Payne, Aurora, Ill., assignor to Nalco Chemical Company, Oak Brook, Ill.

Filed Jun. 1, 1982, Ser. No. 383,720

Int. Cl.³ B05D *3/02;* **B01J** *13/00*

U.S. Cl. 427—397.7 **5 Claims**

1. In a process of manufacturing discrete, ceramic fiber insulation products wherein alumino-silicate fibers are first mixed into a slurry with colloidal silica and then formed into a mat which is thereafter dried, the steps of: providing an alkali-stabilized water suspension of colloidal silica; incorporating in said suspension a surface active amount of a complexing compound comprising the partial condensation product of a higher substituted aliphatic amine and an acid selected from the group consisting of phosphonic acid and aliphatic acids containing from 1 to 6 carbon atoms; and infusing said modified suspension throughout said pre-treated mat of alumino-silicate fibers.

4,430,370

THERMOPLASTIC MOLDED PART WITH STRESS REDUCING JUNCTURE

John E. Gallagher, Lenox, Mass., assignor to General Electric Company, Pittsfield, Mass.

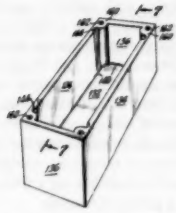
Filed May 5, 1981, Ser. No. 260,819

Int. Cl.³ B65D *1/22*

U.S. Cl. 428—35 **10 Claims**

1. An improved thermoplastic injection molded part, said part including at least one wall member formed unitary with at least one other structural element such as another wall, flange, or boss area, with the improvement comprising a stress reducing juncture, said stress reducing juncture being defined by an elongated trough-like recess located in said one wall adjacent said other structural element, said stress reducing juncture being operative to reduce the differential shrinkage of the

molded plastic which would otherwise develop due to the uneven cooling of the plastic to room temperature, whereby



internal stresses are decreased thereby inhibiting the warping of said part.

4,430,371

WOOD VENEERS

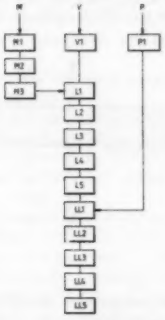
David Boyes, Harrogate, England, assignor to Gerhard Kosche, Much, Fed. Rep. of Germany

Filed Jan. 22, 1982, Ser. No. 341,759

Claims priority, application United Kingdom, Jan. 23, 1981, 8102085

Int. Cl.³ B27D *1/10*; B32B *3/00*

U.S. Cl. 428—61 **6 Claims**



1. A flexible wood veneer comprising a series of veneer leaves backed by a non-woven adhesive-absorbent backing material secured to the leaves by adhesive absorbed in the backing, said non-woven material backed veneer leaves being in butted-together end to end relation at mating finger joints, said finger joints of both the adjoining ends of the veneer leaves and the adjoining ends of the non-woven material backing being bonded together by adhesive between the finger joints, and a continuous plastics composite foil adhered to a rear surface of the non-woven backing material by the adhesive absorbed in the non-woven backing material to form a triple laminate with the non-woven material constituting the intermediate layer of the laminate.

4,430,372

NON-WOVEN FABRIC WITH IMPROVED HOT-PRESS PROPERTIES AND METHOD FOR MANUFACTURING SAME

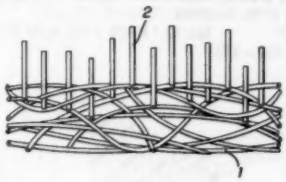
Jürgen Knoke, Weinheim; Holger Buchwald, Hemsbach, and Jürgen Fehlhaber, Gorxheimertal, all of Fed. Rep. of Germany, assignors to Firma Carl Freudenberg, Weinheim, Fed. Rep. of Germany

Filed Jun. 11, 1982, Ser. No. 387,612

Claims priority, application Fed. Rep. of Germany, Nov. 13, 1981, 3145137

Int. Cl.³ B05D *1/14*

U.S. Cl. 428—90 **10 Claims**



1. A multilayer non-woven fabric having improved hot-press properties and a textile-like appearance, consisting essentially of a planar structure of several offset layers of natural and/or synthetic fibers, the fibers of each layer being coated either in whole or in part with a film of an elastic bonding agent and being joined together at their contacting points in the form of an open fiber structure and, protruding from the upper surface of each fiber layer in nap fashion, short fibers of equal length, each of which is bound to the body of one of said layer fibers only at the end face of said short fiber by means of said film; wherein the ratio of the length of the short fibers to the total thickness of the layered structure is about 2–7:1 and wherein the openings in the fiber structure of any layer have maximum diameters which are at least about 5–20 times as large as the diameters of the short fibers; and whereby said multilayered non-woven fabric is porous and exhibits a regular pattern of nap irregularities.

4,430,373

REINFORCED BEAM SECTION AND A METHOD OF PRODUCING IT

Lars Hammarberg, Avant. Poste 3, CH-1005 Lausanne, Switzerland

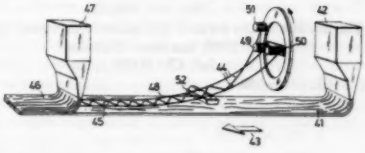
PCT No. PCT/SE81/00357, § 371 Date Dec. 5, 1980, § 102(e) Date Jul. 30, 1982, PCT Pub. No. WO82/01906, PCT Pub. Date Jun. 10, 1982

PCT Filed Dec. 7, 1981, Ser. No. 403,658

Claims priority, application Sweden, Dec. 5, 1980, 8008553

Int. Cl.³ B32B *5/12*

U.S. Cl. 428—113 **5 Claims**



1. A reinforced beam section provided by forming, e.g. compression molding, a board-shaped semi-finished product, characterized in that said product is a wood pulp board known per se having reinforcing threads preferably of glass fiber embedded and bonded therein at least in predetermined zones, said zones are zones around areas of inflection, i.e. changes in

direction in the configuration of the finished section and said reinforcing threads are in the form of continuously running threads, crossing over from one side to another of said inflection points in the configuration of the section in a plurality of places in the longitudinal direction of said inflection points.

4,430,374

CHANNEL-SHAPED TRIM

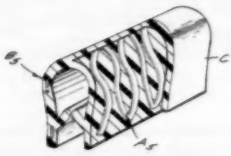
Sazo Ezaki, Bisai, Japan, assignor to Toyoda Gosei Co., Ltd., Nagoya, Japan

Division of Ser. No. 58,385, Jul. 17, 1979, Pat. No. 4,355,448. This application Aug. 10, 1982, Ser. No. 406,981

Claims priority, application Japan, Jul. 17, 1978, 53-98073; Apr. 30, 1979, 54-53618

Int. Cl.³ B32B *3/22, 3/24*

U.S. Cl. 428—135 **5 Claims**



1. A channel-shaped trim having a longitudinally extending opening for embracing and clamping an edge flage of a support member comprising:

a core member;

flexible covering means for covering said core member;

said core member being composed of a metal network of links and a plurality of connecting portions defining spaces therebetween which are linearly disposed in rows extending along the longitudinal and transverse directions of said trim, respectively;

said metal network of links being composed of wave-shaped metal strips;

each of the spaces being disposed between adjacent connecting portions in the longitudinal and transverse directions of said trim; and

at least one part of said plurality of connecting portions of said network being broken in the transverse direction of said trim and being separated in the longitudinal direction of said trim.

4,430,375

ABRASION-RESISTANT LAMINATE

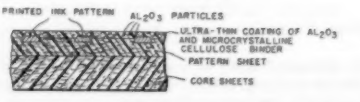
Herbert I. Scher, and Israel S. Ungar, both of Randallstown, Md., assignors to Nevamar Corporation, Odenton, Md.

Continuation of Ser. No. 298,548, Sep. 2, 1981, Pat. No. 4,395,452, which is a division of Ser. No. 136,220, Apr. 1, 1980, Pat. No. 4,305,987, which is a division of Ser. No. 879,848, Feb. 22, 1978, Pat. No. 4,255,480, which is a continuation-in-part of Ser. No. 758,265, Jan. 10, 1977. This application Apr. 15, 1983, Ser. No. 485,521

The portion of the term of this patent subsequent to Mar. 10, 1998, has been disclaimed.

Int. Cl.³ B32B *3/00*

U.S. Cl. 428—148 **15 Claims**



1. A decorative sheet for use in the preparation of decorative laminates of high abrasion resistance, comprising: a decorative paper sheet substrate, and an ultra-thin abrasion resistant porous coating over said decorative substrate, said ultra-thin abrasion resistant coating comprising a mixture of (1) an abrasion resistant hard mineral of particle size 20–50 microns in high concentration sufficient to provide an abrasion resistant layer without interfering with visibility and (2) binder material for said mineral compatible with a thermosetting laminating resin selected from the group consisting of melamine-formaldehyde resin and polyester resin, and being impregnable with said laminating resin, said binder material being present in an amount sufficient to bind and stabilize said abrasion resistant mineral to the surface of said paper sheet.

13. A method of producing a decorative sheet for use in the manufacture of decorative laminates, comprising:

providing a substrate sheet having a decorative appearance and formed of a porous material;

coating said decorative sheet with an ultrathin wet layer of a mixture of (1) an abrasion resistant hard mineral of particle size 20–50 microns in quantities sufficient to provide an abrasion resistant layer without interfering with visibility, and (2) binder material for said mineral, which binder material has the properties of being capable of withstanding heat and pressure, and being compatible with a thermosettable resin, said binder being present in an amount sufficient to bind said abrasion resistant mineral to the surface of said decorative sheet, and the binder-mineral layer in the dry state being permeable to said thermosettable resin;

drying said coated binder coated material mixture at a temperature sufficient to enhance the bonding of said abrasion resistant mineral by said binder material to said decorative sheet, to provide a porous, ultra-thin, dry layer of said binder-mineral mixture thereon.

4,430,376

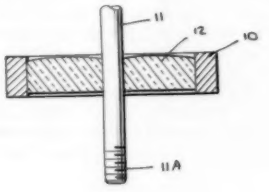
GLASS-TO-METAL COMPRESSION SEALED LEAD-IN STRUCTURE

Leonard J. Box, 1325 Pleasant Valley Way, West Orange, N.J. 07052

Filed Jul. 13, 1982, Ser. No. 397,812

Int. Cl.³ B32B *1/04, 15/00*

U.S. Cl. 428—174 **5 Claims**



1. A glass-to-metal compression sealed lead-in structure for electronic devices comprising:

A an outer metal case having a high coefficient of thermal expansion;

B a lead in conductor of predetermined form extending through the opening in the case, said conductor being formed of steel having a high coefficient of expansion which is machined to the required form of the conductor, the surface of the steel being treated after machining to impart to the conductor a relatively low coefficient of thermal expansion; and

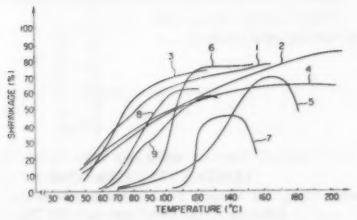
C a glass seal filling the space between the conductor and the case and having a coefficient of thermal expansion which is lower than that of the case and no lower than that of the conductor.

4,430,377

COLD DRAWN HIGH-ORIENTATION MULTILAYERED FILM AND PROCESS FOR MANUFACTURE OF SAID FILM

Isao Yoshimura, Fujisawa; Osamu Mizukami, Kawasaki; Hideo Hata; Junichi Kageyama, both of Yokohama, and Takashi Kaneko, Kawasaki, all of Japan, assignors to Asahi-Dow Limited, Tokyo, Japan

Division of Ser. No. 326,062, Nov. 30, 1981, Pat. No. 4,399,181, which is a continuation of Ser. No. 103,949, Dec. 14, 1979, abandoned. This application Jan. 21, 1983, Ser. No. 459,985
Claims priority, application Japan, Dec. 18, 1978, 53-154966; Mar. 7, 1979, 54-25642
Int. Cl.³ B32B 27/08
U.S. Cl. 428—213 33 Claims



1. A cold drawn high-orientation multilayered film, having a particle tensile strength of not less than 5.0 Kg/mm², the principal component layers of said film being highly oriented, said multilayer film comprising at least one layer preponderantly comprising a cold-drawable resin selected from the group consisting of blended and unblended specific polymers, [1] (B)+(A)+(C), [2] (B)+(A), [3] (B)+(C), [4] (D), and [5] (E), wherein,

(A) is at least one ethylene type polymer selected from the group consisting of copolymers of ethylene with another monomer selected from the group consisting of vinyl esters, aliphatic unsaturated carboxylic acids and alkyl esters of said carboxylic acids, ionically crosslinked resins derived from said copolymers and low-density polymers of ethylene,

(B) is a soft copolymer elastomer having a Vicat softening point of not more than 60° C.,

(C) is at least one polymer selected from the group consisting of crystalline polypropylene, high-density polyethylene, crystalline polybutene-1, and polymethyl pentene-1,

(D) is a crystalline polybutene-1 having a concentration of 50 to 100% by weight, and

(E) is an ionically crosslinked resin, said multilayered film possessing at least two resin layers selected from the group consisting of at least one cold-drawable resin layer (CDR_5) preponderantly containing a polymer [5], at least one cold-drawable resin layer (CDR_{1-3}) preponderantly containing at least one cold-drawable resin selected from the group consisting of blended polymers [1], [2], [3], at least one cold-drawable resin layer (CDR_4) preponderantly containing a polymer [4], and at least one layer (S) formed of at least one polymer selected from the group consisting of crystalline polypropylene, polyethylene, ethylene-vinyl acetate copolymer, ethylene-aliphatic unsaturated carboxylic acid copolymers and ethylene-aliphatic unsaturated carboxylate copolymers,

and said film having a multilayer construction represented by the layer combination of

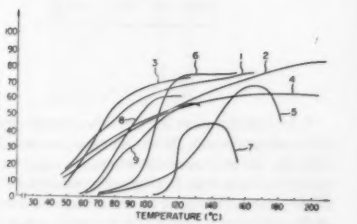
CDR_5/CDR_{1-3},
$CDR_5/CDR_{1-3}/CDR_5$,
$CDR_5/S/CDR_5$, or
$CDR_5/CDR_{1-3}/CDR_4/CDR_{1-3}/CDR_5$.

4,430,378

COLD DRAWN HIGH-ORIENTATION MULTILAYERED FILM AND PROCESS FOR MANUFACTURE OF SAID FILM

Isao Yoshimura, Fujisawa; Osamu Mizukami, Kawasaki; Hideo Hata; Junichi Kageyama, both of Yokohama, and Takashi Kaneko, Kawasaki, all of Japan, assignors to Asahi-Dow Limited, Tokyo, Japan

Division of Ser. No. 326,062, Nov. 30, 1981, Pat. No. 4,399,181, which is a continuation of Ser. No. 103,949, Dec. 14, 1979, abandoned. This application Jan. 21, 1983, Ser. No. 460,012
Claims priority, application Japan, Dec. 18, 1978, 53-154966; Mar. 7, 1979, 54-25642
Int. Cl.³ B32B 27/08
U.S. Cl. 428—213 33 Claims



1. A cold drawn high-orientation multilayered film, having a particle tensile strength of not less than 5.0 Kg/mm², the principal component layers of said film being highly oriented, said multilayer film comprising at least one layer preponderantly comprising a cold-drawable resin selected from the group consisting of blended and unblended specific polymers, [1] (B)+(A)+(C), [2] (B)+(A), [3] (B)+(C), [4] (D), and [5] (E), wherein,

(A) is at least one ethylene type polymer selected from the group consisting of copolymers of ethylene with another monomer selected from the group consisting of vinyl esters, aliphatic unsaturated carboxylic acids and alkyl esters of said carboxylic acids, ionically crosslinked resins derived from said copolymers and low-density polymers of ethylene,

(B) is a soft copolymer elastomer having a Vicat softening point of not more than 60° C.,

(C) is at least one polymer selected from the group consisting of crystalline polypropylene, high-density polyethylene, crystalline polybutene-1, and polymethyl pentene-1,

(D) is a crystalline polybutene-1 having a concentration of 50 to 100% by weight, and

(E) is an ionically crosslinked resin, said multilayered film possessing at least two resin layers selected from the group consisting of at least one cold-drawable resin layer ($CDR_{1-3,4}$) preponderantly containing at least one cold-drawable resin selected from the group consisting of blended polymers [1], [2], [3], and [4], at least one layer (S) formed of at least one polymer selected from the group consisting of crystalline polypropylene, polyethylene, ethyl-vinyl acetate copolymer, ethylene-aliphatic unsaturated carboxylic acid copolymers and ethylene-aliphatic unsaturated carboxylate copolymers, and at least one cold-drawable resin layer (CDR_5), preponderantly containing a polymer [5],

and said film having a multilayer construction represented by the layer combination of

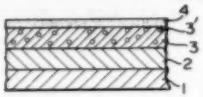
$S/CDR_{1-3,4}$,
$S/CDR_{1-3,4}/S$,
$S/CDR_{1-3,4}/S/CDR_{1-3,4}/S$,
S/CDR_5,
$S/CDR_{1-3,4}/CDR_5$, or
$S/CDR_{1-3,4}/S/CDR_{1-3,4}/CDR_5$.

4,430,379

MASTER PLATE FOR DRY LITHOGRAPHIC PRINTING

Eizi Hayakawa, Utsunomiya; Akio Kojima, Urawa; Yoshi Arai, Oyama; Masatoshi Sakuma, Urawa, and Yukichi Toyoshima, Tokyo, all of Japan, assignors to Dainippon Ink & Chemicals Inc., Tokyo and Kawamura Institute of Chemical Research, Saitami, both of, Japan

Filed Aug. 25, 1981, Ser. No. 296,189
Claims priority, application Japan, Aug. 26, 1980, 55-116392
Int. Cl.³ B32B 7/02; B41N 1/14
U.S. Cl. 428—216 6 Claims



1. In a master plate for dry lithographic printing comprising (1) a substrate and (3) an ink-repellent silicone layer formed thereon, the improvement wherein a toner anchoring layer (2) composed of a resin having compatibility with an image layer (5) to be superimposed on the silicone layer (3) during image making or a resin containing an active group capable of reacting with the image layer (5) during image making is formed between the substrate (1) and the silicone layer (3), and wherein the silicone layer (3) is composed of a silicone resin containing 0.1 to 10% by weight, based on the silicone resin, of a fluorine-containing surface-active compound of the formula

Rf—X—Y

wherein Rf represents a fluorinated aliphatic radical having 3 to 12 carbon atoms, X represents a divalent linking group selected from the group consisting of $-(CH_2)_l-$ in which l is an integer of 1 to 6, —CO— and $—SO_2—$, and Y represents a hydrophilic group having a nitrogen-containing linking moiety or a phosphorus containing linking moiety whereby a portion of said fluorine-containing surface active compound forms a surface-oriented layer (4) on the exposed surface of the silicone layer (3).

4,430,380

BONDED STRUCTURES OF TEXTILE MATERIALS

Hans Hönel; Walter Michel, both of Frankfurt am Main; Steffen Piesch, Oberursel; Karin Schlüter; Manfred Seidel, both of Frankfurt am Main, and Wolfgang Spieler, Hofheim, all of Fed. Rep. of Germany, assignors to Cassella Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 22, 1982, Ser. No. 360,217
Claims priority, application Fed. Rep. of Germany, Mar. 26, 1981, 3111936
Int. Cl.³ B32B 7/00
U.S. Cl. 428—254 11 Claims

1. In a bonded structure of textile materials bonded by a melamine-formaldehyde precondensate and cured at an elevated temperature and a elevated pressure, the improvement comprises said melamine-formaldehyde precondensate having been prepared by heating melamine in an aqueous solution or suspension with formaldehyde in a molar ratio of 1:(0.8 to 1.26) at a pH value of 7–11 in the presence of 1 to 25% by weight of modifying agents relative to the total weight of melamine and formaldehyde, and at least 1.0% being an alkali metal salt or alkaline earth metal salt of amidosulphonic acid, at temperatures of 105° to 160° C. until a limited dilutability with water is achieved or further heating until an unlimited dilutability with water is achieved.

4,430,381

MONOCARBOXYLIC ACID ANTIMICROBIALS IN FABRICS

Susan L. Harvey; James L. Cresswell, and B. Jerry L. Huff, all of Memphis, Tenn., assignors to The Buckeye Cellulose Corporation, Cincinnati, Ohio

Filed Jun. 25, 1982, Ser. No. 392,193
Int. Cl.³ B32B 23/00; B05D 3/02
U.S. Cl. 428—284 17 Claims

1. A process for imparting antimicrobial properties to a material, said process comprising:

(a) applying an external binder system to said material, said external binder system comprising a salt of at least one monocarboxylate antimicrobial agent or mixtures thereof;

(b) applying a waterproofing treatment to said material, said treatment comprising at least one substantially nonantimicrobial proton donor; and

(c) drying said material.

4,430,382

CONDUCTIVE COATING

Joseph Savit, 751 Vernon Ave., Glencoe, Ill. 60022

Filed Dec. 15, 1980, Ser. No. 216,732
Int. Cl.³ B32B 5/16
U.S. Cl. 428—323 6 Claims

1. A translucent dielectric recording media comprising a through-conductive substrate having a dielectric coating and a conductive coating, the conductive coating consisting of nitrocellulose and at least one conductive pigment.

4. The translucent dielectric recording media of claim 1 wherein the conductive pigment is selected from the group consisting of conductive zinc oxide, carbon black, graphite metal particles, cupric oxide and mixtures thereof.

4,430,383

FILAMENTS OF HIGH TENSILE STRENGTH AND MODULUS

Paul Smith, Sittard, and Pieter J. Lemstra, Brunssum, both of Netherlands, assignors to Stamicarbon B.V., Geleen, Netherlands

Division of Ser. No. 162,449, Jun. 24, 1980, Pat. No. 4,442,993. This application Sep. 30, 1982, Ser. No. 428,821
Claims priority, application Netherlands, Jun. 27, 1979, 7904990
Int. Cl.³ D02G 3/00
U.S. Cl. 428—364 2 Claims

1. A solution-spun and drawn high molecular weight $\overline{M}_w$ polyethylene filament of combined high modulus and high tensile strength wherein

said molecular weight $\overline{M}_w$ is at least 8×10^5,

said modulus is at least 20 GPa,

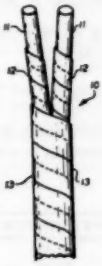
said tensile strength is at least 2 GPa.

4,430,384

FLAME RESISTANT INSULATED ELECTRICAL WIRE AND CABLE CONSTRUCTION

Stephen George, Bronx, N.Y., assignor to Subtex, Inc., Hartsdale, N.Y.

Division of Ser. No. 73,362, Sep. 7, 1979, Pat. No. 4,282,284.
This application Jan. 19, 1981, Ser. No. 225,889
Int. Cl.³ B32B *17/00, 27/00*; H01B *7/00*
U.S. Cl. 428—377 6 Claims



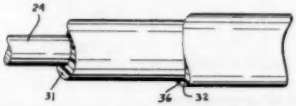
1. A high temperature and flame resistant insulated wire or cable construction comprising:
an electrical conductor;
an insulating tape wrapped around said conductor, said insulating tape comprising:
a porous flame resistant base fabric;
a refractory coating comprising refractory materials and a bonding agent, said refractory coating formed on the surface and interstices of said base fabric by applying said refractory coating to both sides of said fabric, and said refractory materials being capable of fusing with said porous base fabric at elevated temperatures;
a polymeric coating formed on the outside surface of one of the refractory coatings; and
an adhesive applied to the outside surface of the other of said refractory coatings.

4,430,385

COMPOSITELY INSULATED CONDUCTOR HAVING A LAYER OF IRRADIATION CROSS-LINKED POLYMERIC PLASTIC MATERIAL

Harry M. Dillow, DeKalb County, Ga.; Anthony E. Sansone, Sarpy County, Nebr., and Raymond K. Swartz, Gwinnett County, Ga., assignors to Western Electric Company, Inc., New York, N.Y.

Filed Feb. 18, 1982, Ser. No. 349,887
Int. Cl.³ B32B *7/02, 15/00*; D02G *3/00*
U.S. Cl. 428—380 7 Claims



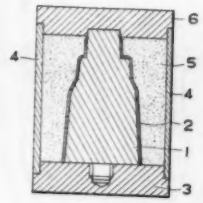
1. A compositely insulated conductor, which comprises:
an elongated metallic conductor;
an inner layer of insulation which covers said conductor and which comprises a plasticized polyvinyl chloride composition; and
an outer layer of insulation being disposed about said inner layer and having a thickness which is substantially less than that of said inner layer, said outer layer comprising an irradiation cross-linked, plasticized polyvinyl chloride composition and having an adhesion to said inner layer which is substantially greater than that of said inner layer to said elongated metallic conductor and which is sufficient to cause any elongation of the adhered inner and outer layers to be substantially unitary.

4,430,386

COMPOSITE METAL SINTERED ARTICLE AND METHOD OF MAKING SAME

Tadao Watanabe; Mitsuo Ohbori; Akio Ohta, and Yoshikazu Kondo, all of Kudamatsu, Japan, assignors to Toyo Kohan Co., Ltd., Tokyo, Japan

Division of Ser. No. 974,521, Dec. 29, 1978, Pat. No. 4,261,745.
This application Dec. 8, 1980, Ser. No. 214,429
Int. Cl.³ B22B *7/04*
U.S. Cl. 428—555 7 Claims



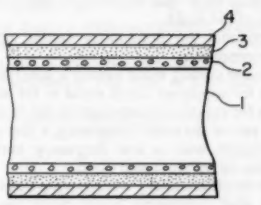
1. A composite metal sintered article, comprising a porous metal sintered body and a metal shell formed on the inner or outer surface of said metal sintered body by electroforming and/or electroless plating and/or vapor deposition, said metal shell having a first metal layer which is hard and wear-resistant, and a second metal layer in contact with said metal sintered body and which is thicker and softer than said first metal layer.

4,430,387

BASE PLATE FOR MAGNETIC RECORDING DISC

Nobuo Nakagawa, Yokohama; Yoshiki Kato, Tokyo; Katsuo Abe, Yokosuka; Takao Edamura, and Takao Nakamura, both of Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 12, 1980, Ser. No. 206,175
Claims priority, application Japan, Nov. 14, 1979, 54-146572
Int. Cl.³ B21C *1/00*
U.S. Cl. 428—579 14 Claims

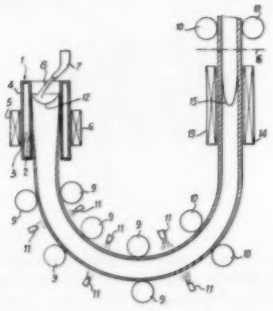


1. A base plate for a magnetic recording disc comprising a light, durable, smooth-surfaced discoid substrate, a thin metal layer formed on at least one side of the substrate, and an anodized layer formed from the surface of said at least one thin metal layer to a depth of at least one-half of the thickness of the thin metal layer by an anodizing treatment, said at least one thin metal layer containing no element which produces surface pin-hole defect portions on the anodized layer formed by the anodizing treatment and being formed by a dry process using, as a vapor source or a target, (a) aluminum having a purity of at least 99.999%; (b) magnesium having a purity of at least 99.999%; or (c) an aluminum-magnesium alloy in which aluminum has a purity of at least 99.999% in an amount of 90.0 to 99.9% by weight and magnesium has a purity of at least 99.999% in an amount of 10.0 to 0.1% by weight.

4,430,388
METHOD AND APPARATUS FOR CONTINUOUSLY CASTING A HOLLOW METAL BLANK, AND THE RESULTING BLANK

Michel Mola, Paris, France, assignor to Creusot-Loire-Vallourec, Paris, France

Filed Jan. 15, 1979, Ser. No. 3,662
Int. Cl.³ B22D 27/02
U.S. Cl. 428—595 **4 Claims**



1. A process for continuous casting of hollow metallic blanks comprising the steps of:
(a) pouring molten liquid metal into a continuously cooled mold of circular cross-section,
(b) rotating the liquid metal in the mold by submitting it to a low frequency first electromagnetic field,
(c) substantially continuously withdrawing a blank having a solidified shell with liquid metal therein downwardly from the bottom of the mold and then directing the blank along a generally U-shaped curved path so that the blank has an ascending portion at a first location spaced horizontally from the mold at an elevation substantially the same as the elevation of the mold,
(d) rotating at a speed over 100 r.p.m. the liquid metal in said ascending portion of the blank by submitting said blank adjacent said first location to a horizontally rotating second electromagnetic field of a frequency in the range of 50 Hz to 300 Hz, and
(e) cutting off the hollow blank thus formed at a second location above said first location and at an elevation above that of the mold.

2. Apparatus for continuous casting of hollow metallic blanks comprising,
an annular casting mold having a generally vertical axis,
means for supplying liquid metal to the mold,
means for rotating liquid metal in the mold generally about the axis of the mold comprising, a first inductive winding energized with a low frequency current and located within or adjacent said mold,
means for continuously withdrawing a blank having a solidified shell containing liquid metal therein downwardly from the bottom of the mold,
means for directing said blank along a generally U-shaped curved path first downwardly and then upwardly so that the blank has an ascending portion at a first location spaced horizontally from the mold and at substantially the same elevation as said mold,
means comprising a second inductive winding adjacent said first location energized with current at a frequency in the range of 50 Hz to 300 Hz, for rotating the liquid metal in said ascending portion of the blank at a speed of rotation over 100 r.p.m., and
means for cutting off the hollow blank thus formed at a second location above said first location and at an elevation above the elevation of the mold.

3. A hollow metal blank having excellent external and internal skin qualities each of equi-axial crystallization and free of dendrites, said blank being formed by the process according to claim 1.

4,430,389
COMPOSITE CYLINDER AND CASTING ALLOY FOR USE THEREIN

Tony U. Otani, Lakewood, Calif., assignor to Wexco Corporation, Lynchburg, Va.

Filed Mar. 1, 1982, Ser. No. 353,236
Int. Cl.³ C22C 29/00, 32/00
U.S. Cl. 428—627 **2 Claims**

2. A composite cylinder comprising:
an outer housing; and
an inner layer around the inner circumference of said housing having a composition substantially as set forth below:

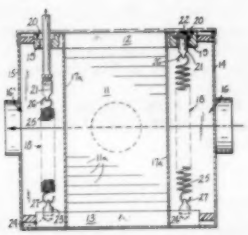
INGREDIENT	WEIGHT PERCENT
tungsten carbide	46–57
nickel	28–40
chromium	5.1–9.5
iron	1.5–2.9
silicon	1.5–2.9
boron	1.0–2.3
carbon	0.5 maximum

with the total of the ingredients being 100%.

4,430,390
COMPACT FUEL CELL STACK

Imre Fekete, deceased, late of Piscataway, N.J. (by Anna M. Fekete, administrator), assignor to Engelhard Corporation, Iselin, N.J.

Filed Sep. 23, 1982, Ser. No. 422,046
Int. Cl.³ H01M 8/04
U.S. Cl. 429—34 **14 Claims**



1. A fuel cell stack comprising:
a plurality of fuel cells connected in superposed, stacked relationship;
first and second support end plates on opposite ends of the stack of fuel cells;
resilient means engaging said first and second end plates to impose thereon a force urging said first and second end plates towards each other, whereby said fuel cells are held together under a predetermined compressive loading, said resilient means being disposed substantially entirely within the space defined between said first and second end plates and the planes within which said end plates lie, whereby the height of said resilient means is not substantially greater than the combined height of said fuel cells and end plates.

4,430,391

FUEL CELL CATHODE

Stanford R. Ovshinsky, Bloomfield Hills; Krishna Sapru, Troy, and Srinivasan Venkatesan, Royal Oak, all of Mich., assignors to Energy Conversion Devices, Inc., Troy, Mich.

Filed Jul. 19, 1982, Ser. No. 399,891
Int. Cl.³ H01M 4/90
U.S. Cl. 429—40 40 Claims

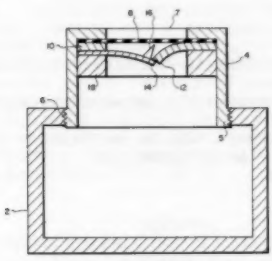
1. A fuel cell comprising:
at least one cathode means for efficient oxygen reduction, said cathode means being formed from a disordered multicomponent material, said cathode means including a host matrix having at least one transition element and incorporating at least one modifier element;
a casing having said cathode means positioned therein;
at least one anode capable of hydrogen oxidation positioned within said casing and spaced from said cathode means; and
an electrolyte in contact with both said anode and said cathode means.

4,430,392

HEAT ACTIVATED VENT

John A. Kelley, Willingboro, N.J., and Curtis A. Michener, Hatfield, Pa., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Feb. 11, 1983, Ser. No. 465,723
Int. Cl.³ H01M 2/12
U.S. Cl. 429—53 10 Claims



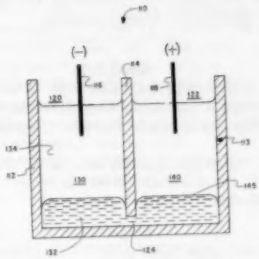
1. A vent comprising:
a vent housing means having a fluid passage therein,
a diaphragm means for sealing said passage,
diaphragm piercing means within said housing,
spring means for urging said diaphragm piercing means into said diaphragm and
heat responsive means for spacing said diaphragm piercing means from said diaphragm means in opposition to said spring means below a predetermined temperature of the housing means and for allowing said spring means to propel said diaphragm piercing means into said diaphragm above said temperature, said heat responsive means including a memory material element having a first shape for restraining said spring means below said temperature to space said piercing means from said diaphragm means and a second shape above said temperature for releasing said spring means.

4,430,393

METAL AMALGAMS FOR SODIUM-SULFUR BATTERY SYSTEMS

John E. Bennett, and David E. Harney, both of Painesville, Ohio, assignors to Diamond Shamrock Corporation, Dallas, Tex.

Filed Jan. 28, 1982, Ser. No. 343,502
Int. Cl.³ H01M 10/36
U.S. Cl. 429—101 10 Claims



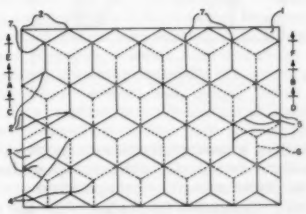
1. In a rechargeable battery utilizing an electrochemical reaction pair of sulfur and a metal selected from the group consisting of the alkali metals and the alkaline earth metals comprising:
(1) a chamber;
(2) a partition, at least partially separating said chamber and thereby defining an anode compartment and a cathode compartment;
(3) a cathode in said cathode compartment in electrical communication between said anode compartment and a point external to said chamber;
(4) an anode at least partially contained in said anode compartment in electrical communication between said cathode compartment and a point external to said chamber; and
(5) anhydrous ammonia electrolyte; characterized in that said anode is a liquid amalgam containing substantially mercury and said metal.

4,430,394

SEPARATOR FOR STORAGE BATTERY

Dieter Bechtold, Frankfurt am Main, Fed. Rep. of Germany, assignor to Varta Batterie Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Filed Feb. 1, 1982, Ser. No. 344,819
Claims priority, application Fed. Rep. of Germany, Mar. 5, 1981, 3108241
Int. Cl.³ H01M 2/16
U.S. Cl. 429—147 12 Claims



1. A separator for storage batteries, and particularly lead storage batteries, in the form of a porous plate provided with protrusions and having channels extending along both the front and the rear side for gas removal along the plate surface,

the plate being provided with protrusions and recesses on both sides, the protrusions extending substantially symmetrically in both directions perpendicularly from a virtual central plane, the protrusions on both sides being all of similar shape and being distributed over the surface in a uniform grid-like pattern,

the protrusions on one side being displaced from each other in accordance with a fixed periodicity, and

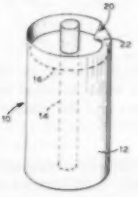
the protrusions on one side forming the recesses on the other side of the plate, the protrusions having oblique faces which collectively define a pyramid.

4,430,395

CELL WITH OVERFLOW SPOUT

Stuart M. Davis, Madison, and Greg J. Davidson, Cross Plains, both of Wis., assignors to Rayovac Corporation, Madison, Wis.

Filed Jan. 4, 1982, Ser. No. 337,007
Int. Cl.³ H01M *2/24*
U.S. Cl. 429—158 **17 Claims**



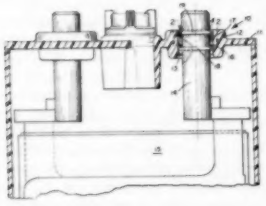
1. A galvanic cell comprising a container having side walls and an open end, the open end of the container having an edge, anodic material, cathodic material, and an electrolyte disposed within the container, a sealant sealing the open end of the container, a sealant overflow spout formed in the cell wall within or adjacent to the edge, the spout forming a passageway for an excess of the sealant to flow in a directed manner and harden outside the confines of the container.

4,430,396

BATTERY TERMINAL POST SEAL

William B. Hayes, Jr., Cinnaminson, N.J., assignor to GNB Batteries Inc., Mendota Heights, Minn.

Filed Dec. 21, 1981, Ser. No. 332,708
Int. Cl.³ H01M *2/08*
U.S. Cl. 429—184 **19 Claims**



1. In a battery, a terminal structure comprising:

a case wall portion provided with a through opening defined by a peripheral cylindrical sealing surface;

a terminal post extending longitudinally through said opening and having at least one integrally formed rigid, peripheral sealant-retaining dam disposed within said opening, projecting to and engaging the lower portion of said sealing surface to define a seal space extending laterally between said terminal post and the lower portion of said sealing surface and longitudinally above said dam along said terminal post portion disposed within said opening;

passage means for introducing and conducting flowable sealant material into said seal space from exteriorly thereof; and

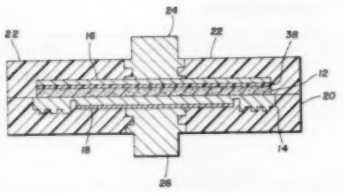
a body of viscous, flowable sealing material disposed in said sealing space, fixedly sealed to said terminal post and movably sealed to said peripheral sealing surface.

4,430,397

ELECTROCHEMICAL CELLS

Darrel F. Untereker, Cedar, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.

Filed Jul. 6, 1981, Ser. No. 280,902
Int. Cl.³ H01M *6/18*
U.S. Cl. 429—191 **61 Claims**



1. An electrochemical cell comprising anode and cathode means in operative relationship, the cathode means comprising:

an iodine-containing cathode;

cathode current collector means, and

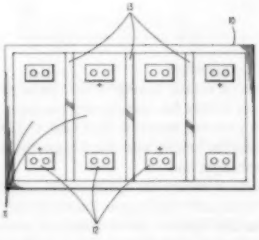
a conductive liquid layer interposed between the cathode and the currect collector for electrically interconnecting the two, the liquid layer comprising iodine dissolved in a solvent.

4,430,398

SEPARATOR MATERIAL FOR ALKALINE STORAGE CELLS

Erich F. Kujas, Vincentown, N.J., assignor to RCA Corporation, New York, N.Y.

Filed May 4, 1982, Ser. No. 374,696
Int. Cl.³ H01M *2/14*
U.S. Cl. 429—206 **9 Claims**



1. A process of preparing a separator for an alkaline power cell comprising:

(a) treating sheets of fibrous polypropylene to create surface porosity by passing them through a corona discharge; and

(b) impregnating the sheets with a glycine selected from the group consisting of phenylglycine, parahydroxyphenylglycine and mixtures thereof.

4,430,399

METHOD OF ELECTRODE FORMATION AND ARTICLE

Robert J. Schoolcraft, Croton, N.Y., assignor to Duracell Inc., Bethel, Conn.

Division of Ser. No. 190,549, Sep. 25, 1980. This application Feb. 1, 1982, Ser. No. 344,345

Int. Cl.[3] H01M 4/02

U.S. Cl. 429—218 8 Claims

1. An electrode for an electrochemical cell comprising a compressed mass of a plurality of agglomerates of an electrochemically active compound, a first conductive material substantially uniformly distributed throughout each agglomerate, and a matrix of a second conductive material interposed between the agglomerates.

4,430,400

METHOD OF PRODUCING COLOR FILTERS USING DEHYDRATING SOLUTION

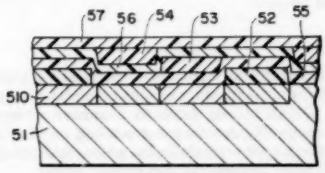
Toshio Nakano, Tokyo; Yoshio Taniguchi, Hino; Ken Tsutsui, Tokyo; Akira Sasano, Tokyo; Tadeo Kaneko, Nishitama; Akiya Izumi, Mobara, and Michiaki Hashimoto, Yono, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 21, 1981, Ser. No. 304,153

Claims priority, application Japan, Sep. 19, 1980, 55-129320

Int. Cl.[3] G03F 5/00; G03C 5/00

U.S. Cl. 430—7 16 Claims



1. A method of producing color filters, which comprises the steps of forming a layer of an organic polymeric material having a predetermined light-sensitive characteristic on a substrate, exposing the layer of the organic polymeric material to a predetermined pattern, developing the exposed layer of the organic polymeric material to form a filter base and dyeing the filter base, wherein after the development of the layer of the organic polymeric material but before said dyeing, said filter base is wetted with at least one dehydrating solution, and wherein after the step of wetting the filter base with the at least one dehydrating solution, said filter base is heated in an atmosphere maintained at 100° to 300° C.

4,430,401

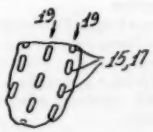
METHOD FOR PRODUCING A RECORDING DISC STAMPER

Richard L. Wilkinson, Torrance, Calif., assignor to Discovision Associates, Costa Mesa, Calif.

Division of Ser. No. 48,081, Jun. 19, 1979. This application May 5, 1980, Ser. No. 146,820

Int. Cl.[3] G03C 5/04, 5/00, 11/00; G01D 15/10

U.S. Cl. 430—8 10 Claims



1. A method of producing a metallic stamper for use in forming recording disc replicas, said method comprising the steps of:

depositing a light-absorbing coating on a smooth, planar surface of a substrate, to form a recording disc, the light-absorbing coating including an explosive material and having a uniform thickness of less than about 6000 Å;

rotating the recording disc in a prescribed fashion relative to a beam of light that is modulated in intensity in accordance with a data signal to be recorded in the light-absorbing coating, said coating being selectively heated by the beam to induce spaced explosions, therein, to form corresponding irregularities in the outer surface of the coating, said irregularities having sizes substantially smaller than five microns and being formed without the need for a separate step of chemically developing the coating;

depositing an outer layer of metallic material on the recording disc, after the surface irregularities have been formed in the light-absorbing coating; and

removing the outer metallic layer from the underlaying recording disc, to produce the metallic stamper.

4,430,402

DICHROMATIC ELECTROPHOTOGRAPHY USING TWO DEVELOPER COMPOSITIONS APPLIED SEQUENTIALLY

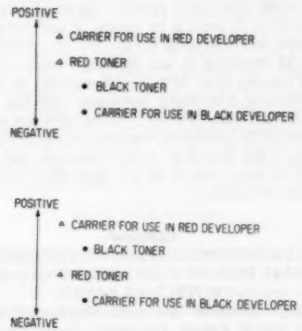
Shuichi Tsushima, Tokyo, Japan, assignor to Ricoh Co., Ltd., Tokyo, Japan

Division of Ser. No. 172,732, Jul. 28, 1980, abandoned. This application Jun. 29, 1982, Ser. No. 393,235

Claims priority, application Japan, Aug. 2, 1979, 54-99216

Int. Cl.[3] G03G 13/01, 13/08, 13/22

U.S. Cl. 430—45 1 Claim



1. A process for dichromatically developing a single electrostatic latent image having positively charged area or areas and negatively charged area or areas, comprising:

providing a set of first and second, separate, dry developer compositions, said first dry developer composition consisting essentially of a first mixture of first toner particles and first carrier particles adapted to be triboelectrically charged in opposite polarities, said second dry developer composition consisting essentially of a second mixture of second toner particles and second carrier particles adapted to be triboelectrically charged in opposite polarities, said first and second toner particles being respectively different in color and also being adapted to be triboelectrically charged in opposite polarities relative to each other by contact with their respective associated carrier particles, said first carrier particles being triboelectrically charged by contact with said first toner particles to a positive potential higher than those of said first and second toner particles and said second carrier particles being triboelectrically charged by friction with said second toner particles to a negative potential lower than those of

said first and second toner particles: applying to said electrostatic latent image one of said dry developer compositions so that the charged toner particles of said one dry developer composition adhere to the area or areas of said electrostatic latent image having a first polarity opposite to the polarity of said charged toner particles of said one dry developer composition whereby to develop said area or areas with a first color, then applying to said electrostatic latent image the other of said dry developer compositions so that the charged toner particles of said other dry developer composition adhere to the area or areas of said electrostatic latent image of a second polarity opposite to the polarity of said charged toner particles of said other dry developer composition whereby to develop the latter area or areas with a second color.

4,430,403

METHOD OF PREPARING A LITHOGRAPHIC PRINTING MASTER

Virgil W. Westdale, Barrington, and James L. Hanrahan, Mt. Prospect, both of Ill., assignors to AM International, Inc., Chicago, Ill.

Filed Mar. 26, 1982, Ser. No. 362,541
Int. Cl.³ G03G *15/20*
U.S. Cl. 430—49 **9 Claims**

1. A process of preparing a lithographic printing master which comprises:

forming an electrostatic latent image on the surface of an electrophotographic lithographic member;

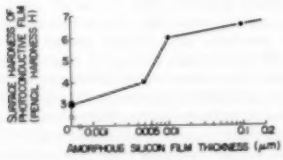
developing said latent image with a developer composition comprising a low melt viscosity polyamide resin having a melting point within the range of from about 70° to 165° C. and a melt viscosity of 1000 centipoises or less, a magnetic oxide component present in an amount ranging from about 40 to 75 percent by weight of said developer composition, and from about 0.5 to 4.0% of conductive carbon pigment imparting to said developer composition a resistivity ranging from 50 to 1×10^5 ohm-cm, said developer composition comprising developer particles ranging in size of from about 8 to 40 microns, with not more than 1 percent of the developer composition comprising particles having a size less than about 8 microns; and fixing said image to said member by the application of heat in the absence of pressure.

4,430,404

ELECTROPHOTOGRAPHIC PHOTOSENSITIVE MATERIAL HAVING THIN AMORPHOUS SILICON PROTECTIVE LAYER

Akira Hosoya; Kunihiro Tamahashi; Shigeharu Onuma, all of Hitachi; Atsushi Kakuta, Hitachiota; Yasuki Mori, Hitachi; Katsuhito Suzuki, Mito, and Hirosada Morishita, Hitachi, all of Japan, assignors to Hitachi, Ltd.; Hitachi Koki Co., Ltd., both of Tokyo, Japan

Filed Apr. 26, 1982, Ser. No. 371,956
Claims priority, application Japan, Apr. 30, 1981, 56-64182; May 8, 1981, 56-68141
Int. Cl.³ G03G *5/14*
U.S. Cl. 430—58 **13 Claims**



1. An electrophotographic photosensitive material having an electrically conductive substrate; a photoconductive layer formed on said electrically conductive substrate; and a substantially continuous amorphous silicon layer as a surface protection layer for the photoconductive layer, the thickness of which is so controlled that it has substantially no ability to absorb the light used.

5. An electrophotographic photosensitive material having an electrically conductive support; a carrier transportation layer and a carrier generating layer formed on said support; and a substantially continuous amorphous silicon layer which is formed in the outermost part as a surface protection layer, and the thickness of which is, when a light signal is irradiated thereto, such that it has substantially no ability to absorb the light.

4,430,405

XERORADIOGRAPHIC MATERIAL AND METHOD OF MAKING SAME

Yoshihiro Ono, and Hiroshi Sunagawa, both of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Tokyo, Japan

Filed Sep. 29, 1982, Ser. No. 421,071
Claims priority, application Japan, Oct. 1, 1981, 56-156695
Int. Cl.³ G03G *5/087*
U.S. Cl. 430—95 **13 Claims**

1. A xeroradiographic material comprising a substrate at least one surface of which is electrically conductive, and an X-ray sensitive layer provided on the electrically conductive surface of said substrate, said X-ray sensitive layer essentially consisting of an organic binder, (i) γ-form crystal grains of a bismuth oxide-based compound oxide represented by the following general formula:

$$Bi_xMO_n$$

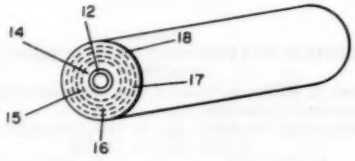
in which M designates at least one of germanium, silicon, titanium, gallium and aluminum, x denotes a number satisfying the condition $10 \leqq x \leqq 14$, and n denotes a number of oxygen atoms stoichiometrically determined depending on M and x, and (ii) inorganic n-type semiconductor grains, said constituents (i) and (ii) being dispersed in said organic binder.

4,430,406

FUSER MEMBER

James S. Newkirk, LeRoy, and Robert A. Wiederhold, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 22, 1981, Ser. No. 313,914
Int. Cl.³ B21B *31/08*; B05D *1/02, 1/34*
U.S. Cl. 430—99 **40 Claims**



39. The method of fusing a heat-softenable toner image to a receiver which comprises

pressure contacting a heat-softenable toner image carried by a receiver with a fusing member at a temperature effective to fuse said toner image to said receiver member, said fuser member having a composite layer including:

(1) a first layer of a first material which is a high-temperature resistant elastomer;

(2) a second layer of a second material which is a high-temperature resistant elastomer; and

(3) a layer intermediate to and continuous with said first and second layers in which the proportion of the first material

to the second material gradually varies from substantially only said first material to substantially only said second material.

4,430,407

HEAT FUSIBLE SINGLE COMPONENT TONER HAVING A POLYAMIDE BINDER

Virgil W. Westdale, Barrington, Ill., assignor to AM International, Inc., Chicago, Ill.

Filed Mar. 26, 1982, Ser. No. 362,534
Int. Cl.³ G03G 9/14
U.S. Cl. 430—106.6 4 Claims

1. An electrophotographic single-component heat-fusible developer composition comprising a low melt viscosity polyamide resin having a melting point within the range of from about 70° to 165° C. and a melt viscosity of 1000 centipoises or less, and magnetic oxide, wherein 90% of said composition comprises particles ranging from about 12 to 35 microns and not more than 1% of said composition comprises particles less than about 8 microns and a conductive carbon pigment in an amount of from about 0.5 to 4.0% of said composition, the conductivity of said carbon pigment being such so as to impart a resistivity to said developer ranging from 50 to 1×10^5 ohm-cm said developer composition having the capacity to develop an electrostatic latent image and being fixed by heat fusing, in the absence of pressure.

4,430,408

DEVELOPING POWDER COMPOSITION CONTAINING A FLUORINE-MODIFIED ALKYL SILOXANE

George G. Sitaramiah, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jun. 25, 1982, Ser. No. 392,063
Int. Cl.³ G03G 9/14
U.S. Cl. 430—106.6 24 Claims

1. A mono-component toner powder composition comprising a plurality of discrete particles each comprising

(a) from about 40 to 70 weight percent thermoplastic binder selected from the group consisting of (i) polyester resins, (ii) copolymers of styrene monomers and at least one monomer selected from acrylate and methacrylate monomers, and (iii) a wax component having a melting point in the range of from about 45° C. to 150° C., and (iv) a blend of said wax component and a thermoplastic organic resin, wherein the weight ratio of said wax component to said thermoplastic organic resin is in the range of from about 1/0.1 to 1/1;

(b) from about 30 to 60 weight percent of a magnetically responsive material dispersed therein;

(c) from about 0.05 to 2 weight percent of a fluorine-modified alkyl siloxane dispersed therein; and

(d) from about 0.005 to 0.3 weight percent of carbon black attached to the exterior surface thereof so that essentially all of the said carbon black particles protrude from said particles of said toner powder composition.

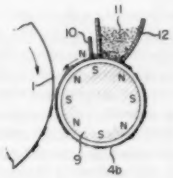
4,430,409

DEVELOPER FOR ELECTROPHOTOGRAPHY WITH WET PROCESS SILICIC ACID

Toru Matsumoto, Kita, and Masanori Takenouchi, Urawa, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 314,438, Oct. 23, 1981, abandoned. This application Jul. 29, 1983, Ser. No. 518,317
Claims priority, application Japan, Oct. 31, 1980, 55-154462; Nov. 4, 1980, 55-154938; Aug. 8, 1981, 56-124227
Int. Cl.³ G03G 9/10, 9/14, 9/08
U.S. Cl. 430—106.6 21 Claims

1. A positively charged developer for electrophotography, comprising a toner particle containing a finely divided silicic acid which is prepared by a wet process and has a pH value of



6 to 11 when suspended at a concentration of 4% by weight in distilled water.

4,430,410

METHOD AND APPARATUS FOR DEVELOPING LATENT ELECTROSTATIC IMAGES

Tatsuo Aizawa, Osaka; Shoji Matsumoto, Neyagawa; Kaoru Sakata, Hirakata; Toshikazu Matsui, Kishiwada; Akira Fushida, Suita; Toshimitsu Ikeda, Himeji, and Nobuyoshi Hisao, Neyagawa, all of Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

Filed Aug. 27, 1979, Ser. No. 70,052
Int. Cl.³ G03G 13/09
U.S. Cl. 430—122 10 Claims

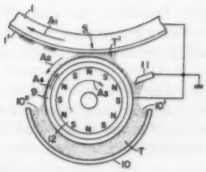
1. A method for developing a latent electrostatic image formed on the surface of an image-bearing material by applying a powdery developer thereto, which comprises magnetically retaining a layer of a relatively conductive one-component developer having a resistivity of not more than 10^{13} ohms-cmm on the surface of a developer-retaining member, and bringing the developer on the surface of the developer-retaining member into contact with the surface of the image-bearing material, characterized in that said developer-retaining member has a resistance, measured by a point-plane resistance measuring method in an environment kept at a temperature of 20° C. and a humidity of 50%, of 3×10^7 ohms to 1×10^{10} ohms.

4,430,411

DEVELOPING METHOD FOR ELECTROSTATIC IMAGE

Yasuyuki Tamura, Kawasaki; Masashi Kiuchi, Toride; Tohru Takahashi, Tokyo; Yasuo Mitsuhashi, Yokohama, and Seiji Tomari, Toride, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 27,722, Apr. 6, 1979, abandoned. This application Mar. 9, 1981, Ser. No. 241,973
Claims priority, application Japan, Apr. 11, 1978, 53-42487; Apr. 21, 1978, 53-47512
Int. Cl.³ G03G 13/09
U.S. Cl. 430—122 18 Claims



1. A development process comprising:

providing a one-component magnetic developer consisting of particles which have an insulating main component on the surface of which there are scattered areas in which

electric charges are movable, said magnetic developer, as a whole, being electrically insulative under mechanically static conditions;

supplying the developer to a developer carrying member;

forming a magnetic field around the developer carrying member by magnetic field forming means; and

simultaneously moving the magnetic field and the developer carrying member in the same direction with the magnetic field moving at a speed high enough with respect to the speed of the developer carrying member to convey the developer on the developer carrying member in the opposite direction to the movement direction of both the magnetic field and developer carrying member and toward a developing station where the developer contacts an image bearing member, said movement stirring the developer and causing some of the developer to be attracted to the potential on the image bearing member in the developing station.

4,430,412

METHOD AND APPARATUS FOR TRANSFERRING AND FIXING TONER IMAGE USING CONTROLLED HEAT

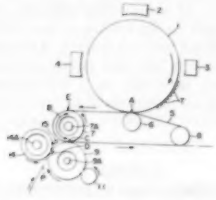
Tadashi Miwa, Kunitachi; Kiyoshi Kimura, Iruma; Yukiharu Komiya, and Noriyoshi Tarumi, both of Hachioji, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Nov. 5, 1982, Ser. No. 439,426

Claims priority, application Japan, Nov. 13, 1981, 56-181195; Nov. 16, 1981, 56-182292; Nov. 16, 1981, 56-182293

Int. Cl.³ G03G *13/14, 13/20*

U.S. Cl. 430—126 **45 Claims**



1. In a method for transferring and fixing toner image wherein a toner image is transferred to an intermediate transfer member from a toner image retainer and then transferred and fixed onto a transfer material from the intermediate transfer member, the improvement characterized in that the toner image on the intermediate transfer member is heated at a temperature lower than the toner fusion temperature, a unit to press the transfer material onto the intermediate transfer member is heated to the toner fusion temperature or over, and the transfer material heated to the toner fusion temperature or over is then fed into a position for transfer and fixation, thereby transferring and fixing the toner image onto the transfer material.

2. In an apparatus for transferring and fixing toner image wherein a toner image is transferred to an intermediate transfer member from a toner image retainer and then retransferred and fixed onto a transfer material from the intermediate transfer member, the improvement comprising means to heat the toner image on the intermediate transfer member to a temperature lower than the toner fusion temperature, heating means to heat a pressing unit to press the transfer material onto the intermediate transfer member at the toner fusion temperature or over and heating means to heat the transfer material at the toner fusion temprerature or over, thereby feeding the transfer material into a position for transfer and fixation.

4,430,413

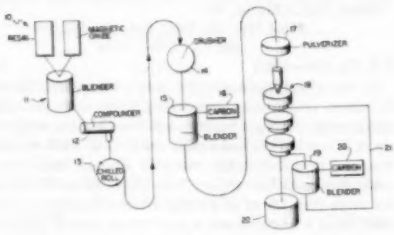
METHOD OF MAKING A SINGLE COMPONENT TONER

Virgil W. Westdale, Barrington, and James L. Hanrahan, Mt. Prospect, both of Ill., assignors to AM International, Inc., Chicago, Ill.

Filed Mar. 26, 1982, Ser. No. 362,536

Int. Cl.³ G03G *9/08, 9/14*

U.S. Cl. 430—137 **7 Claims**



1. A process for preparing an electrophotographic single component developer composition which comprises:

providing a blend of a low melt viscosity polyamide resinous material having a melting point within the range of from about 60° to 165° C. and a melt viscosity of 1000 centipoises or less having incorporated therein a magnetic oxide component in an amount ranging from about 40 to 75 percent by weight;

processing said blend so as to produce a particulate developer composition containing developer particles ranging in size up to about 40 microns;

classifying said particulate developer composition so as to remove therefrom substantially all of the fine developer particles present therein having a size of up to about 8 microns;

blending said classified developer particles with conductive particles with conductive carbon particles such that said conductive carbon is present in an amount of from about 0.5 to 4.0% of said composition so as to effectively incorporate said carbon particles onto the surface thereof said developer particles having a resistivity of from 50 ohm-om to 1.0×10^5 ohm-cm; and

reclassifying said developer particles so as to remove from said developer composition excess carbon particles present therein which are not attached to said developer particles.

4,430,414

IMAGE STABILIZERS FOR VESICULAR FILM

Jerome E. Swanson, Oakdale, Minn., assignor to Minnesota Mining & Manufacturing Company, St. Paul, Minn.

Filed Nov. 12, 1982, Ser. No. 440,874

Int. Cl.³ G03C *1/60, 1/00*

U.S. Cl. 430—176 **14 Claims**

1. In a vesicular imaging material capable of furnishing a record in the form of a distribution pattern of radiation scattering discontinuities formed within an optically clear thermoplastic hydrophobic film, comprising a homopolymer or copolymer of α-chloroacrylonitrile and a light decomposable material substantially uniformly dispersed therein, said material upon exposure to light decomposing into products which are volatile to form said radiation scattering discontinuities only in the light struck areas in said polymer to furnish thereby said record, the improvement wherein a derivative of benzoic acid is present in an image-stabilizing amount in said material.

4,430,415
HEAT-DEVELOPABLE PHOTOGRAPHIC MATERIAL WITH FINE DROPLETS CONTAINING SILVER HALIDE, ORGANIC SILVER SALT OXIDIZING AGENT AND COLOR IMAGE FORMING SUBSTANCE

Toshiaki Aono; Hiroshi Hara; Hideki Naito, and Kozo Sato, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 2, 1982, Ser. No. 414,137
Claims priority, application Japan, Sep. 2, 1981, 56-138266
Int. Cl.³ G03C *5/54, 7/00, 1/40, 5/16*
U.S. Cl. 430—203 **55 Claims**

32. A heat-developable diffusion transfer color photographic material comprising a support having coated in order thereon a photographic element (I) comprising a packet emulsion prepared by forming fine droplets of complex coacervate containing a light-sensitive silver halide, an organic silver salt oxidizing agent and a color image forming substance by complex coacervation and hardening the fine droplets with a hardening agent, a hydrophilic binder and a reducing agent; and an image receiving element (II) comprising a mordant for a dye image formed or released by heat development in the photographic element.

4,430,416
TRANSFER ELEMENT FOR SANDBLAST CARVING

Hiraku Goto, Owariasahi; Tsuneaki Usui, Nagoya, and Nobuyasu Kinoshita, Hirakata, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka and Akebono Process Co. Ltd., Aichi, both of, Japan

Filed Jun. 27, 1980, Ser. No. 163,546
Int. Cl.³ B24C *1/04;* **B44C** *1/22;* **G03C** *11/12;* **G03F** *7/26*
U.S. Cl. 430—263 **8 Claims**

1. A transfer element for sandblast carving comprising, in order, a flexible substrate, an intermediate resin layer having a thickness of about 0.001 to about 1 mm which is strippable from the flexible substrate and is a pressure-sensitive adhesive to an etchable material, and a resist having a thickness of about 0.05 to about 5 mm comprising a photocured photosensitive resin, and the relationship of adhesions (a) between the flexible substrate and the intermediate resin layer, (b) between the intermediate resin layer and the resist and (c) between the resist and the etchable material being (a)<(b)<(c).

8. A process for sandblast carving which comprises:

(i) printing a photo positive design on the photosensitive resin layer of an element comprising, in order, a flexible substrate, an intermediate resin layer which is strippable from the flexible substrate and is a pressure-sensitive adhesive to an etchable material, and a photosensitive resin layer,

(ii) removing unexposed portions of the photosensitive resin layer to form a transfer element for sandblast carving comprising, in order, the flexible substrate, the intermediate resin layer and a resist of the photocured photosensitive resin,

(iii) closely contacting the resist and the intermediate resin layer of the transfer element with the surface of the etchable material,

(iv) stripping the flexible substrate from the intermediate resin layer, and

(v) conducting sandblast operation, wherein the relationship of adhesions (a) between the flexible substrate and the intermediate resin layer, (b) between the intermediate resin layer and the resist and (c) between the resist and the etchable material being (a)<(b)<(c).

4,430,417
PHOTOPOLYMERIZABLE MIXTURES CONTAINING ELASTOMERIC BLOCK POLYMERS AND PHOTOCURABLE ELEMENTS PRODUCED THEREFROM

Gerhard Heinz, Weisenheim; Peter Richter, Frankenthal, and Wolfgang F. Mueller, Neustadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Sep. 17, 1982, Ser. No. 419,492
Claims priority, application Fed. Rep. of Germany, Sep. 19, 1981, 3137416
Int. Cl.³ G03C *1/68*
U.S. Cl. 430—286 **9 Claims**

1. A photopolymerizable mixture which contains (a) from 40 to 99% by weight, based on (a) and (b), of at least one block copolymer which is soluble in a developer solvent and consists only of elastomeric non-theroplastic polymer blocks, at least two elastomeric polymer blocks having a glass transition temperature of from −20° C. to +15° C. and at least one elastomeric polymer block located between two such blocks and having a glass transition temperature of below −20° C., (b) from 1 to 60% by weight, based on (a) and (b), of at least one photopolymerizable ethylenically unsaturated low molecular weight compound compatible with the elastomeric block copolymer (a), (c) from 0.1 to 10% by weight, based on the total photopolymerizable mixture, of at least one photopolymerization initiator, and (d) from 0 to 40% by weight, based on the total photopolymerizable mixture, of further additives.

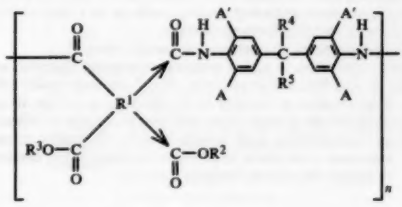
4,430,418
RADIATION-SENSITIVE POLYIMIDE PRECURSOR COMPOSITION DERIVED FROM A DIARYL FLUORONATED DIAMINE COMPOUND

David L. Goff, Springfield, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 30, 1982, Ser. No. 430,856
Int. Cl.³ G03C *1/68*
U.S. Cl. 430—288 **14 Claims**

1. A radiation-sensitive polyimide precursor composition, comprising:

a. a polymer of the formula



wherein

n is a positive integer corresponding to the number of units in the polymer and is sufficiently large to provide the polymer with a number average molecular weight of about 1500–15,000 as determined by vapor pressure osmometry, and wherein for any particular unit in the polymer: → denotes isomerism;

R^1 is a tetravalent, aromatic, non-halogen containing, organic radical containing at least one ring of six carbon atoms, said ring characterized by benzenoid unsaturation, the four carbonyl groups being attached directly to separate carbon atoms in a ring of the R^1 radical;

R^2 and R^3 are selected from the group consisting of a hydrogen radical and any organic radical containing a

photopolymerizable olefinic double bond, at least one of R^2 and R^3 being said organic radical;

R^4 and R^5 are selected from the group consisting of perfluoro and perhalofluoro aliphatic hydrocarbons having 1 to 8 carbons; and A and A' are selected from the group consisting of H, Cl, Br, and NO_2;

b. a radiation-sensitive polymerizable polyfunctional acrylate compound; and

c. a photopolymerization initiator system comprising hydrogen donor initiator and aromatic biimidazole.

4,430,419

POSITIVE RESIST AND METHOD FOR MANUFACTURING A PATTERN THEREOF

Katsuhiro Harada, Mito, Japan, assignor to Nippon Telegraph & Telephone Public Corporation, Tokyo, Japan

Filed Jan. 15, 1982, Ser. No. 339,414

Claims priority, application Japan, Jan. 22, 1981, 56-8266; Sep. 4, 1981, 56-139353

Int. Cl.³ G03C *5/00*

U.S. Cl. 430—296 **11 Claims**

1. A method of forming a pattern of a positive resist comprising:

(a) forming on a substrate a film of a positive resist consisting essentially of a copolymer having 60 to 90 mol% of phenylmethacrylate and 40 to 10 mol% of methacrylic acid;

(b) heating said positive resist film to cross-link said copolymer;

(c) selectively radiating said heated positive resist film with a high energy beam selected from the group consisting of an electron beam and X-rays to thereby form a latent image; and

(d) developing said latent image with a developing solution which has a strong ability to dissolve said resist.

4,430,420

PHOTOTHERMOGRAPHIC ELEMENT AND PROCESS COMPRISING AN AMMONIA OR AMINE RESPONSIVE IMAGING MATERIAL

Anthony Adin, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 27, 1982, Ser. No. 412,443

Int. Cl.³ G03C *1/02*

U.S. Cl. 430—351 **23 Claims**

1. In a photothermographic element comprising a support bearing, in reactive association, a photothermographic layer comprising photographic silver halide, a dye-forming coupler and a hydrazone reducing agent which, in its oxidized form, reacts with the dye-forming coupler,

the improvements comprising the combination of

(a) an ammonia or amine responsive imaging material, and

(b) as said hydrazone reducing agent, an aminosulfonylhydrazone that is capable of developing an image in said photothermographic layer and that is capable of releasing an aminosulfinic acid which, in turn, thermally releases ammonia or an amine to generate an image in the ammonia or amine responsive imaging material.

4,430,421

METHOD OF DISPERSING PHOTOGRAPHIC ADJUVANTS IN HYDROPHILIC COLLOID COMPOSITIONS

Christian C. Van de Sande, Belsele; Jan J. Vandewalle, Mortsel; Raphaël K. Van Poucke, Berchem, and Andre K. Claes, Oevel, all of Belgium, assignors to Agfa-Gevaert, N.V., Mortsel, Belgium

Filed Dec. 29, 1982, Ser. No. 454,244

Claims priority, application United Kingdom, Jan. 26, 1982, 8202098

Int. Cl.³ G03C *5/14*

U.S. Cl. 430—377 **11 Claims**

1. Method of dispersing photographic adjuvants in hydrophilic colloid compositions in the presence of one or more oil-formers, characterized in that at least one of said oil-formers is a high-boiling substantially water-insoluble oil-former of the class of dihydroxymethyl(5,2,1,$0^{2,6}$)tricyclodecane and carboxylic, phosphoric, or phosphonic di-ester derivatives thereof.

4,430,422

METHOD OF DISPERSING PHOTOGRAPHIC ADJUVANTS IN A HYDROPHILIC COLLOID COMPOSITION

Christian C. Van de Sande, Belsele; Jan J. Vandewalle, Mortsel; Luc K. Martens, and Raphaël K. Van Poucke, both of Berchem, all of Belgium, assignors to Agfa-Gevaert, N.V., Mortsel, Belgium

Filed Dec. 29, 1982, Ser. No. 454,251

Claims priority, application United Kingdom, Jan. 26, 1982, 8202100

Int. Cl.³ G03C *5/14*

U.S. Cl. 430—377 **11 Claims**

1. Method of dispersing photographic adjuvants in a hydrophilic colloid composition in the presence of one or more oil-formers, characterized in that at least one of said oil-formers is a high-boiling substantially water-insoluble oil-former of the class of 1,3-dialkyloxy-2-propanols and carboxylic, phosphoric, or phosphonic esters thereof.

4,430,423

COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Kozo Aoki, and Michio Ono, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-Ashigara, Japan

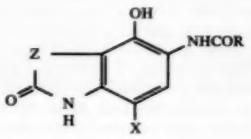
Filed Dec. 20, 1982, Ser. No. 451,229

Claims priority, application Japan, Dec. 18, 1981, 56-204746

Int. Cl.³ G03C *7/16, 7/26*

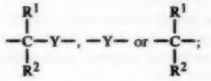
U.S. Cl. 430—384 **19 Claims**

17. A method of forming a color image comprising developing an imagewise exposed a color photographic light-sensitive material comprising a support having coated thereon at least one silver halide emulsion layer, the color photographic light-sensitive material containing a cyan dye forming coupler represented by the following general formula (I):



(I)

wherein Z represents



R represents a substituted or unsubstituted alkyl group, a substituted or unsubstituted aryl group or a substituted or unsubstituted heterocyclic group; X represents a hydrogen atom or a group capable of being released upon an oxidative coupling reaction with a developing agent; Y represents

—O— or —S—; R^1 and R^2, which may be the same or different, each represents a halogen atom, a substituted or unsubsti-

tuted alkyl group, a substituted or unsubstituted aryl group, a substituted or unsubstituted alkoxy group, a substituted or unsubstituted alkoxycarbonyl group, a substituted or unsubstituted alkylcarbonyl group, a substituted or unsubstituted arylcarbonyl group, a substituted or unsubstituted carbamoyl group, a substituted or unsubstituted acylamino group or a nitryl group or R^1 and R^2 together represents an oxo group; and R^3 represents a hydrogen atom, a substituted or unsubstituted alkyl group or a substituted or unsubstituted aryl group with an alkaline aqueous solution containing an aromatic amine developing agent.

4,430,424
COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Ken Okauchi, and Tatsuhiko Kobayashi, both of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Sep. 1, 1982, Ser. No. 413,687
Claims priority, application Japan, Sep. 4, 1981, 56-140037
Int. Cl.³ G03C *1/76*
U.S. Cl. 430—537 **22 Claims**

1. A color photographic light-sensitive material comprising a support and a hydrophilic colloid layer coated thereon, said layer comprising a non-diffusible coupler and a hydrophilic colloid layer having an aromatic primary amine developing agent and/or a precursor thereof, said material further comprising a polymer layer at the furthest position from the support on the same side of said support as said hydrophilic colloid layer wherein said polymer layer is permeable to an alkaline processing liquid but less permeable to said aromatic primary amine developing agent and/or a precursor thereof and said developing agent or precursor thereof has a diffusion rate, while dissolved in said alkaline processing liquid, in said polymer layer which is not greater than 5×10^{-8} cm²/second at room temperature.

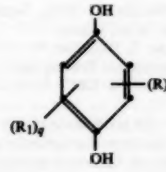
4,430,425
COLOR PHOTOGRAPHIC MATERIALS CONTAINING STABILIZERS

David G. Leppard, Rheinfelden, Switzerland, assignor to Ciba-Geigy AG, Basel, Switzerland

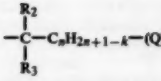
Filed Jun. 18, 1982, Ser. No. 389,995
Claims priority, application United Kingdom, Jun. 19, 1981, 8119014
Int. Cl.³ G03C *7/26, 7/38*
U.S. Cl. 430—551 **21 Claims**

1. A colour photographic silver halide material which comprises on a support at least one colour coupler-containing silver halide emulsion layer, there being present in the silver halide emulsion layer(s) or in a layer adjacent to the silver halide emulsion layer(s)

(a) a hydroquinone compound of the formula



wherein p is 1 or 2 and q is 0 or 1, provided that p+q is 1 or 2, R is a radical of the formula



wherein Q is selected from the residues

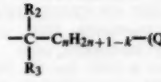
(1) —$COZR_4$, wherein Z is 0 or NR_5, and R_4 is hydrogen, alkyl having 1 to 20 carbon atoms, optionally interrupted by 1 to 5 oxygen atoms, and optionally substituted by a group OR_6, wherein R_6 is cycloalkyl having 3 to 12 carbon atoms, alkenyl having 3 to 20 carbon atoms, aryl having 6 to 10 carbon atoms optionally substituted by one or two alkyl groups (each) having 1 to 4 carbon atoms or aralkyl having 7 to 13 carbon atoms or R_4 is alkenyl having 3 to 20 carbon atoms or cycloalkyl having from 3 to 12 carbon atoms, aryl having from 6 to 10 carbon atoms optionally substituted by alkyl having 1 to 4 carbon atoms, or aralkyl having from 7 to 13 carbon atoms, a 5 or 6 membered heterocyclic ring containing an oxygen atom, and optionally substituted by one or two alkyl groups (each) having 1 to 4 carbon atoms, or methyl substituted by a 5- or 6-membered heterocyclic ring containing an oxygen atom and optionally substituted by one or two alkyl groups (each) having 1 to 4 carbon atoms, and when Z is —NR_5, R_5 is hydrogen or alkyl having 1 to 20 carbon atoms, or R_4 and R_5 together with the nitrogen atom to which they are bonded form a 5 or 6 membered heterocyclic ring, optionally substituted by one or two alkyl groups (each) having 1 to 4 carbon atoms;

(2) —OX, wherein X is R_5 or COR_7, wherein R_5 is as defined above and R_7 is hydrogen or alkyl having 1 to 20 carbon atoms, alkenyl having 3 to 20 carbon atoms, cycloalkyl having 3 to 12 carbon atoms, aralkyl having 7 to 13 carbon atoms or aryl having 6 to 10 carbon atoms, optionally substituted by one or two alkyl groups each having 1 to 4 carbon atoms;

(3) —NR_8R_9 wherein R_8 is hydrogen or alkyl having 1 to 4 carbon atoms and R_9 is hydrogen, alkyl having 1 to 4 carbon atoms or —COR_7, wherein R_7 is as defined above, or R_8 and R_9, together with the nitrogen atom to which they are bonded, form a 5- or 6-membered ring, optionally substituted by one or two alkyl groups (each) having 1 to 4 carbon atoms;

(4) —$P(O)(OR_{10}')([O]_xR_{11}')$ wherein x is 0 or 1, and if x is 1, R_{10}' and R_{11}' are independently of each other hydrogen or alkyl having 1 to 20 carbon atoms or R_{10}' and R_{11}' are linked together to form an alkylene chain having 2 or 3 carbon atoms optionally substituted by one or more alkyl groups each having 1 to 20 carbon atoms, and if x is 0, R_{10}' is alkyl having 1 to 5 carbon atoms;

(5) —SO_2R_{12}', wherein R_{12}' is hydroxyl, chlorine or —NR_5R_7, wherein R_5 and R_7 are as defined above, provided that, if R_{12}' is hydroxyl, R_1 is a residue of formula



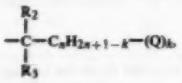
or

(6) cyano;

n is an integer from 1 to 20, k is 1 or 2,

R_2 and R_3 are independently of each other alkyl having 1 to 5 carbon atoms and, if Q is CO_2R_4, either R_2 or R_3 is optionally substituted by —CO_2R_4, or R_2 or R_3 is so linked to the residue C_nH_{2n+1-k} that there is formed a cycloalkylene residue having 5 to 12 carbon atoms substituted by —$(CO_2R_4)_k$, wherein R_4 and k are as defined above,

R_1 is alkyl having 1 to 8 carbon atoms, or a residue of formula



and if R_1 is a residue of this formula, then R_1 and R are the same or different; or

(b) there being present salts thereof with organic or inorganic acids or bases.

4,430,426

STABILIZATION OF SILVER HALIDE EMULSIONS

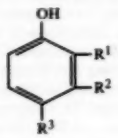
George W. Beebe, Roseville; Philip Hine, St. Paul; Nelson B. O'Bryan, Maplewood, and Steven M. Shor, St. Paul, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jun. 4, 1982, Ser. No. 385,276

Int. Cl.³ G03C *1/06*

U.S. Cl. 430—604 **13 Claims**

1. A photographic silver halide emulsion in a hydrophilic binder having therein a speed stabilizing amount of a stabilizing system comprising 5 to 95 percent by weight of said system of a uracil and from 95 to 5 percent by weight of said system of a substituted phenol of the formula:



wherein

R^1 is selected from the group consisting of aldoxime, amide, anilide, and ester,

R^2 and R^3 are selected from the group consisting of hydrogen, hydroxy, alkoxy, and alkyl, with at least one of R^2 and R^3 being hydrogen or together R^2 and R^3 form a fused-on benzene ring.

4,430,427

RED ABSORBING COMBINATION OF ALCOHOL OXIDASE AND AN AZIDE COMPOUND

Thomas R. Hopkins, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 4, 1980, Ser. No. 203,923

Int. Cl.³ C12Q *1/26*; C12N *9/02, 9/04, 9/96*

U.S. Cl. 435—25 **28 Claims**

1. A composition of matter comprising active alcohol oxidase; and

an azide compound selected from the group of compounds having the formula $R''(N_3)_x$ wherein R'' is a metal atom, a hydrogen atom, or the ammonium radical, and N_3 is the moiety N═N═N,

the azide compound being present in an amount effective to form a red absorbing combination with active alcohol oxidase.

4,430,428

COMPOSITION OF MATTER AND PROCESS

Thomas H. Fraser, Kalamazoo, and Barbara J. Bruce, Portage, both of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Continuation of Ser. No. 119,037, Feb. 5, 1980, abandoned. This application Dec. 7, 1981, Ser. No. 327,835

Int. Cl.³ C12P *21/00*; C12N *15/00, 1/18*; C12R *1/865*

U.S. Cl. 435—68 **3 Claims**

1. SHY 3 (pUC 1014) having the deposit accession number NRRL Y-12096.

4,430,429

PRODUCTION OF VITAMIN B_{12}-ACTIVITY SUBSTANCES

Joseph G. Zeikus, and Joseph A. Krzycki, both of Madison, Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Jul. 23, 1981, Ser. No. 286,247

Int. Cl.³ C12P *19/42*; C12N *1/32, 1/20*; C12R *1/01*

U.S. Cl. 435—86 **9 Claims**

1. The process for producing vitamin B_{12}-active substances which comprises cultivating a vitamin B_{12}-active substance producing microorganism selected from the species of *Methanosarcina barkeri* DSM D800 and *Butyribacterium methylotrophicum* ATCC 33266 under anaerobic conditions in a culture medium containing methanol as the main source of assimilable carbon, a source of assimilable nitrogen, essential minerals, growth factors and cobalt ions and then recovering the vitamin B_{12}-active substances from the culture broth.

4,430,430

METHOD FOR PRODUCING L-ARGININE BY FERMENTATION

Haruo Momose, Kamakura; Masaaki Ishida, Kawasaki, and Mahito Terabe, Yokohama, all of Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Filed Jun. 10, 1981, Ser. No. 272,286

Claims priority, application Japan, Jun. 13, 1980, 55-79959

Int. Cl.³ C12P *13/10*; C12N *1/20*; C12R *1/19*

U.S. Cl. 435—114 **5 Claims**

1. A method for producing L-arginine by fermentation which comprises culturing in a culture medium an L-arginine producing microorganism selected from the group consisting of transformat NRRL B-12426 and transformat NRRL B-12427.

4,430,431

PRODUCING FUSAFUNGINE

Jacques P. Servier, Neuilly sur Seine, France, assignor to Biofarma, Neuilly sur Seine, France

Filed Apr. 7, 1982, Ser. No. 366,371

Claims priority, application France, Apr. 7, 1981, 81 06917

Int. Cl.³ C12P *1/02*; C12N *1/14*; C12R *1/77*

U.S. Cl. 435—171 **1 Claim**

1. In a process for the production of the antibiotic fusafungine which includes the step of aerobically growing a fusafungine-producing strain of *Fusarium lateritium* in a synthetic nutrient medium, the improvement which comprises: employing, as the fusafungine-producing strain of *Fusarium lateritium*, the strain identified as *Fusarium lateritium servier* CBS 675.80.

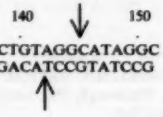
4,430,432

ENDO-DEOXYRIBONUCLEASE AND PROCESS FOR THE PRODUCTION THEREOF

Tadahiko Ando; Takehiko Shibata, and Hiroomi Watabe, all of Tokyo, Japan, assignors to Rikagaku Kenkyusho, Wako, Japan

Filed Mar. 1, 1982, Ser. No. 353,226
Claims priority, application Japan, Mar. 9, 1981, 56-33321
Int. Cl.[3] C12N *9/22, 15/00;* C12R *1/84, 1/85*
U.S. Cl. 435—199 5 Claims

1. Endo-deoxyribonuclease A (Endo-DNase A) which has the substrate specificity of recognizing specific base sequence in double-stranded deoxyribonucleic acid (DNA) molecules and cleaving the strands at specified site(s) in the DNA to produce specific DNA fragments: the DNase A being capable of recognizing the following nucleotide sequence in the molecule of pBR 322 DNA and cleaving the said DNA in one position sequence at the indicated vertical arrows,



and cleaving ϕ105C phage DNA and M2 phage DNA in several positions, and λ phage DNA, ϕNR2 phage DNA, ϕ1 phage DNA, SPP1 phage DNA and ρ11 phage DNA in many positions; having the optimum pH of 6.5 to 10.0 in 50 mM Tris-HCL buffer; having the working temperature of about 30° to about 37° C.; being activated with Mg^{++} or Mn^{++}; being inhibited with more than 0.2 M of NaCl or KCl, and having molecular weight of about 80,000 daltons measured by a gel filtration method using Ultro gel AcA 44, said enzyme being obtained from a cell-free extract of a DNaseA-producing microorganism belonging to the genus Saccharomyces or Pichia in a culture medium, collecting the cells thereof, obtaining cell-free extract therefrom, separating and collecting the DNase A.

4,430,433

PRODUCTION OF ARYL ACYLAMIDASES

Peter M. Hammond, Melton Mowbray; Christopher P. Price, Stapleford, and Michael D. Scawen, Salisbury, all of England, assignors to Public Health Laboratory Service Board, London, England

Filed Dec. 1, 1981, Ser. No. 326,275
Claims priority, application United Kingdom, Dec. 2, 1980, 8038633
Int. Cl.[3] C12N *9/80, 1/20;* C12R *1/39, 1/40*
U.S. Cl. 435—228 26 Claims

1. A process for producing an aryl acylamidase enzyme which comprises

a. culturing bacteria of one of the strains *Pseudomonas fluorescens* ATCC 39005 or arylacylamidase producing mutants or variants thereof, or *Pseudomonas putida* ATCC 39004 or aryl acylamidase producing mutants or variants thereof in a culture medium in which said bacterial strains produce aryl acylamidase, to produce an enzyme containing material consisting of the aryl acylamidase enzyme and other unwanted substances, and

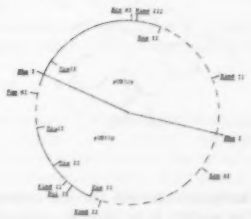
b. collecting the enzyme containing material.

4,430,434

PLASMID AND ITS USE

Johan P. M. Sanders, Delft, Netherlands, and Andrew J. P. Docherty, Bristol, England, assignors to Gist Brocades NV, Wateringseweg, Netherlands

Filed May 7, 1980, Ser. No. 147,483
Claims priority, application United Kingdom, May 11, 1979, 7916377
Int. Cl.[3] C12N *1/20, 15/00, 1/00;* C12P *21/00*
U.S. Cl. 435—253 21 Claims



1. Plasmid conferring resistance to streptomycin (Sm^R) and neomycin (Neo^R) upon its host, constructed from derivatives or segments of plasmids pUB109 and pUB110, which is capable of replicating and expressing genetic information in Bacillus and which after having taken up a foreign DNA fragment at one of its restriction sites with loss of its Sm^R or Neo^R phenotype but not both, is still capable of replicating and expressing genetic information in its host.

4,430,435

ASSAY SYSTEM

James V. Patzke, and Burton J. Rosenberg, both of Raleigh, N.C., assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

Filed Dec. 24, 1980, Ser. No. 220,105
Int. Cl.[3] G01N *33/16;* A61K *43/00;* G01T *1/00*
U.S. Cl. 436—504 38 Claims

18. The method of measuring the concentration of neuroleptic drug and any active metabolites thereof in blood plasma or blood serum containing same which comprises (a) mixing together blood plasma or blood serum with radioactive dopamine receptor binder, blocking agent of formula (1)

(1)

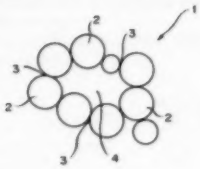
wherein R^1, R^2 and R^3 are the same or different and are each lower alkyl or lower alkoxy lower alkyl and dopamine receptor material and measuring the amount of the radioactive dopamine receptor binder on the dopamine receptor material and (b) mixing together a concentration of a standard amount of non-radioactive dopamine receptor binder, dopamine receptor material and the same radioactive dopamine receptor binder as in (a) and measuring the amount of radioactive dopamine receptor binder on the dopamine receptor material.

4,430,436

ANALYTICAL ELEMENT AND METHOD OF USE

Mikio Koyama; Shozo Kikugawa; Kenichiro Okaniwa, and Kiyoshi Tamaki, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Dec. 9, 1981, Ser. No. 329,034
Claims priority, application Japan, Dec. 17, 1980, 55-179614
Int. Cl.³ G01N *21/78, 33/52, 33/54*
U.S. Cl. 436—531 29 Claims



1. In an analytical element for the determination of the presence of an analyte in a liquid containing the same, said analytical element having an interconnected void structure zone positioned on one side of a liquid-impermeable, light-transmissive support, the improvement comprising:

said interconnected void structure zone comprising a plurality of heat-stable organic polymer particle units having reactive groups and having a particle size of from 1 to 350 microns, said particle units being chemically bonded directly to each other through said reactive groups, said particle units being arranged in the form of a bound particulate structure having a three-dimensional lattice, said bound particulate structure being non-swellable in said liquid and having interconnected voids wherein the void volume of said bound particulate structure is between 25 and 85% to thereby permit said liquid to permeate therethrough.

4,430,437

TEST METHODS EMPLOYING MONOCLONAL ANTIBODIES AGAINST *HERPES SIMPLEX* VIRUS TYPES 1 AND 2 NUCLEOCAPSIDS PROTEINS

Berge Hampar, Middletown; Martin Zweig, Walkersville, and Harvey Rabin, Braddock Heights, all of Md.; Conrad J. Heilman, Jr., Chester, N.Y.; Ralph F. Hopkins, III; Russell H. Neubauer, both of Frederick, Md., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Filed Aug. 27, 1980, Ser. No. 181,954
Int. Cl.³ G01N *33/54, 33/56, 33/58*
U.S. Cl. 436—548 10 Claims

1. In a method of clinical testing and differentiating antibodies to *Herpes simplex* virus, HSV-1 and HSV-2, employing a competition immunoprecipitation, test, the improvement which comprises employing in said test as reagents monoclonal antibodies to the respective viruses HSV-1 and HSV-2 nucleocapsid p. 40 and p. 45 proteins of which antibodies are produced by hybrid cell lines ID4 (HSV-1) and 3EI (HSV-2).

5. The method of testing and differentiating *Herpes simplex* virus, HSV-1 and HSV-2, in a test sample which comprises reacting the infected samples with monoclonal antibodies against the nucleocapsid p. 40 and p. 45 proteins of HSV-1 and HSV-2, respectively, and noting the reaction thereof by immuno-peroxidase assay, immunofluorescence assay, enzyme-linked immunoabsorbent assay immunoprecipitation assay, or radioimmunoassay.

4,430,438

ENAMEL FRIT AND A PROCESS FOR TWO-LAYER AND MULTI-LAYER ONE-FIRE ENAMELLING

Otto Krist, Overath, Fed. Rep. of Germany; Heinz Drave, Baltimore, Md., and Jozef Luypaert, Brussels, Belgium, assignors to Bayer Aktiengeseilschaft, Leverkusen, Fed. Rep. of Germany

Filed Apr. 22, 1982, Ser. No. 371,029
Claims priority, application Fed. Rep. of Germany, May 5, 1981, 3117706; Mar. 13, 1982, 3209140
Int. Cl.³ C03C *5/00*
U.S. Cl. 501—17 9 Claims

1. A process for two-layer and multi-layer one-bake enamelling of metal sheets by the successive wet application of aqueous ground enamel slips, optionally intermediate enamel slips and cover enamel slips, followed by baking, characterised in that saccharides and/or their oxidation, reduction and/or conversion products and/or polyethylene glycol are added during preparation of the ground enamel slip and, optionally, the intermediate enamel slip, the additives containing up to 50, preferably up to 25, carbon atoms per molecule.

4,430,439

MONOLITHIC REFRACTORIES

Thomas R. Kleeb, Pittsburgh, Pa., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Jan. 12, 1983, Ser. No. 457,345
Int. Cl.³ C04B *35/80*
U.S. Cl. 501—95 4 Claims

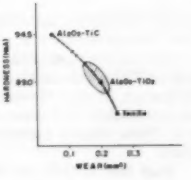
1. Monolithic refractories consisting essentially of, by weight, 0.2 to 0.6% vinyl chloride acetate fibers, and the balance non-basic refractory aggregates, and a binding agent, said monolithic refractories having improved steam spalling resistance.

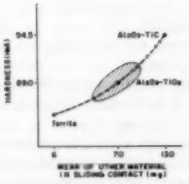
4,430,440

MAGNETIC HEAD SLIDER MATERIAL

Toshiaki Wada, Osaka; Mitsuhiko Furukawa, Fukuoka; Michito Miyahara, Fukuoka; Masaharu Shiroyama, Fukuoka; Kiyohito Misumi, Kurume, and Takashi Kitahira, Fukuoka, all of Japan, assignors to Sumitomo Special Metal Ltd., Osaka and Nippon Tungsten Co., Ltd., Fukuoka, both of, Japan

Filed May 28, 1982, Ser. No. 383,329
Claims priority, application Japan, May 29, 1981, 56-83150
Int. Cl.³ C04B *35/49, 35/10;* B23B *27/14*
U.S. Cl. 501—105 5 Claims





1. A wear-resistant product which is useful in fabricating magnetic head sliders, said product consisting essentially of 40

to 80% by weight of Al_2O_3, 20 to 60% by weight of TiO_2, 0.5 to 5 parts by weight, based on 100 parts by weight of combined Al_2O_3 and TiO_2, of at least one oxide selected from the group consisting of CaO, MgO and Y_2O_3, and 0.5 to 10 parts by weight, based on 100 parts by weight of combined Al_2O_3 and TiO_2, of ZrO_2 which has a purity of at least 99.0% and maximum particle diameters of 2 microns; said product having a hardness of between about 89.0 and 89.3 (HrA) and a wear resistance of between about 0.1 and about 0.3 mm^3 (pin-disk method).

4,430,441

COLD SETTING SAND FOR FOUNDRY MOULDS AND CORES

Sergei S. Zhukovsky, ulitsa Profsojuznaya 17, korpus 1, kv. 15; July M. Junovich, ulitsa Veshnyakovskaya, 11, korpus 1, kv. 201; Viktor N. Pertsovsky, ulitsa Ordzhonikidze, 6"A", kv. 5; Vyacheslav S. Kolesnikov, Volgogradsky prospekt, 145/8, kv. 117, Moscow; Igor P. Renzhin, ulitsa Kalinina, 72, kv. 12, Sverdlovsk, and Semen I. Rivkin, Kolpino, Pavlovskaya, 84, kv. 46, Leningrad, all of U.S.S.R.

PCT No. PCT/SU80/00095, § 371 Date Jan. 18, 1982, § 102(e) Date Jan. 18, 1982, PCT Pub. No. WO81/03445, PCT Pub. Date Dec. 10, 1981

PCT Filed May 30, 1980, Ser. No. 342,011

Int. Cl.³ C04B *35/04*

U.S. Cl. 501—109 **20 Claims**

1. A cold setting sand comprising:

from 95 to 99 weight percent of a refractory filler containing magnesium oxides, iron oxides, silicon oxides or mixtures thereof and from 1 to 5 weight percent of an organic acid having a dissociation constant of 10^{-5} to 10^{1}.

4,430,442

CATALYSTS FROM MOLYBDENUM POLYSULFIDE PRECURSORS AND THEIR PREPARATION

Willard H. Sawyer, and Howard L. Mitchell, III, both of Baton Rouge, La., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Jul. 20, 1982, Ser. No. 399,947

Int. Cl.³ B01J *27/02, 31/12, 27/24*

U.S. Cl. 502—220 **20 Claims**

1. A process for the preparation of a new and improved highly active, highly selective hydrotreating catalyst which comprises

contacting together and decomposing in the presence of hydrogen, hydrocarbon, and sulfur a catalyst precursor salt characterized by the formula

$$B_x[Mo_3S_z]$$

where

B is an ammonium ion, polyammonium ion, or quaternary phosphonium ion, or a hydrocarbyl substituted ammonium ion, hydrocarbyl substituted polyammonium ion, or hydrocarbyl substituted tertiary or quaternary phosphonium ion,

x is 1 where B is a divalent cationic moiety, or 2 where B is a monovalent cationic moiety,

$[Mo_3S_z]$ is a divalent anionic moiety wherein z is an integer ranging from about 10 to about 46, to form said hydrotreating catalyst.

4,430,443

SUPPORTED CARBON-CONTAINING MOLYBDENUM AND TUNGSTEN SULFIDE CATALYSTS, THEIR PREPARATION AND USE

Robert L. Seiver, Baton Rouge, La., and Russell R. Chianelli, Sommerville, N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Jul. 20, 1982, Ser. No. 400,005

Int. Cl.³ B01J *27/02, 31/12, 27/24, 27/20*

U.S. Cl. 502—220 **20 Claims**

1. A process for the preparation of supported carbon-containing molybdenum sulfide and tungsten sulfide catalysts which comprises

compositing a preselected quantity of a porous, refractory inorganic oxide with a salt characterized by the formula

$$B_x[MO_yS_{4-y}]$$

where B is an organo or hydrocarbyl substituted diammonium ion, an organo or hydrocarbyl substituted ammonium ion or quaternary ammonium ion, or an ionic form of a cyclic amine containing one or more basic N atoms, x is 1 where B is an organo or hydrocarbyl substituted diammonium ion, or 2 where B is an organo or hydrocarbyl substituted ammonium or quaternary ammonium ion or an ionic form of a cyclic amine containing one or more basic N atoms, M is molybdenum or tungsten, and y is 0, or a fraction or whole number ranging up to 3, and

heat decomposing the salt of said catalyst precursor composite in the presence of a gaseous admixture containing hydrogen and hydrogen sulfide to form said supported carbon-containing molybdenum sulfide or tungsten sulfide catalyst.

4,430,444

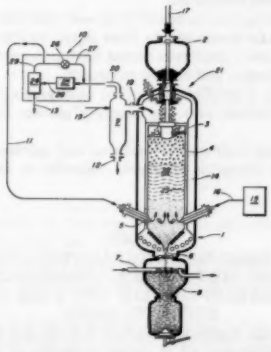
METHOD OF MAKING METHANOL USING A SLAGGING GASIFIER

Eric H. Reichl, Greenwich, Conn., assignor to Conoco Inc., Wilmington, Del.

Filed Mar. 8, 1982, Ser. No. 356,017

Int. Cl.³ C07C *27/06, 31/04*

U.S. Cl. 518—703 **2 Claims**



1. A process for producing methanol from solid coal consisting essentially of the steps as follows:

(a) providing

(i) a slagging gasifier (1),

said slagging gasifier comprising a coal hopper (2), a coal distributor stirrer (3), tuyeres (5), a slag quench chamber wall enclosing a slag quench chamber (8), a circulating quench water inlet conduit (7) and a slagging tap (6),

(ii) a gas quencher (9)

(iii) methanol formation reactor (25)

(iv) a condenser (24) and
(v) valve (26)
said coal hopper being disposed above said coal distributor stirrer,
said coal distributor stirrer being disposed above said tuyeres,
said slagging gasifier being connected to said gas quencher by gasifier output conduit (18),
said gas quencher being connected to said methanol formation reactor by scrubber outlet gas conduit (20), said methanol formation reactor being connected by conduit (28) to said condenser, said condenser being connected by conduit (29) to said valve, said conduit (29) being connected to conduit (11),
said conduit (11) being connected to said tuyeres and said valve being connected by conduit (27) to said scrubber output gas conduit,
said methanol formation reactor containing catalyst suitable for formation of methanol from hydrogen and carbon monoxide,

(b) gasifying said coal in said slagging gasifier by heating coal in said gasifier to form ash and gaseous gasifier output mixture comprising tar, solids, hydrogen sulfide, hydrogen, carbon monoxide and methane, said gasifying consisting of:
(i) feeding said coal through said hopper and over said distributor stirrer,
(ii) feeding steam, oxygen and an uncondensed gaseous mixture through said tuyeres,
(iii) feeding water through said circulating quench water inlet conduit into said slag quench chamber to cool ash passing to said quench chamber,

(c) contacting said gaseous gasifier output mixture with liquid water in said gas quencher to form a gaseous quencher output mixture comprising hydrogen, carbon monoxide and methane,

(d) adding a recycle portion of gaseous condenser output mixture comprising hydrogen, carbon monoxide and methane to said gaseous methanol formation reactor feed mixture,

(e) contacting said methanol formation catalyst with said gaseous methanol formation reactor feed mixture in said methanol formation reactor to form a condenser feed mixture comprising methanol vapor, methane, hydrogen and carbon monoxide,

(f) condensing said methanol from said condenser feed mixture in said condenser to form liquid methanol product and a gaseous condenser output mixture comprising methane, hydrogen and carbon monoxide,

(g) feeding a gasifier portion of said gaseous condenser output mixture into said slagging gasifier through said tuyeres,

whereby liquid methanol is produced and substantially all of the methane formed is ultimately returned to said slagging gasifier.

4,430,445

NOVEL BASIC IMIDAZOLYLMETHYLSTYRENE COMPOUND, ITS POLYMER, A PROCESS FOR THE PREPARATION THEREOF AND A USE AS ION EXCHANGE RESIN

Tetsuya Miyake, Suginami; Kunihiko Takeda, and Keishi Tada, both of Yokohama, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

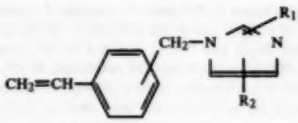
Continuation-in-part of Ser. No. 165,451, Jul. 2, 1980, abandoned. This application Dec. 30, 1981, Ser. No. 335,943

Claims priority, application Japan, Jul. 19, 1979, 54-90901; Jan. 16, 1981, 56-3739; Jan. 19, 1981, 56-4954; Jan. 19, 1981, 56-4955

Int. Cl.³ B01J *39/20*; C08F *26/06*

U.S. Cl. 521—38 **46 Claims**

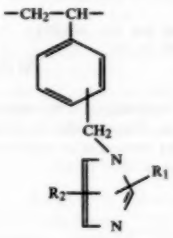
1. A basic compound represented by the following structural formula (I):



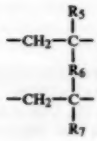
(I)

wherein R_1 and R_2 each independently stand for a hydrogen atom, a straight chain or branched alkyl group having 1 to 17 carbon atoms, a phenyl group unsubstituted or substituted with one or more substituents selected from C_1–C_8 straight chain or branched alkyl groups, halogen atoms and an amino group, a naphthyl group, an aralkyl group having as an alkyl moiety a C_1–C_4 straight chain or branched alkylene group and as an aryl moiety a phenyl group unsubstituted or substituted with one or more substituents selected from halogen atoms and an amino group, a pyridyl group unsubstituted or substituted with one or more substituents selected from C_1–C_4 straight chain or branched alkyl groups, halogen atoms and an amino group, or a nitro group.

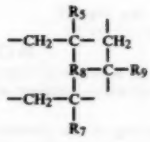
43. A method of ion exchange which comprises contacting with an aqueous ferric chloride solution a cross-linked copolymer consisting of a structural unit of the formula(V), and either or both of the structural units of the formula(VII) and (VIII):



(V)



(VII)

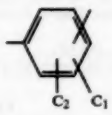


(VIII)

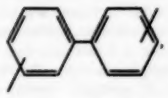
wherein

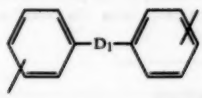
R_1 and R_2 each independently stand for a hydrogen atom, a straight chain or branched alkyl group having 1 to 17 carbon atoms, a phenyl group unsubstituted or substituted with one or more substituents selected from C_1–C_8 straight chain or branched alkyl groups, halogen atoms and an amino group, a naphthyl group, an aralkyl group having as an alkyl moiety a C_1–C_4 straight chain or branched alkylene group and as an aryl moiety a phenyl group unsubstituted or substituted with one or more substituents selected from halogen atoms and an amino group, a pyridyl group unsubstituted or substituted with one or more substituents selected from C_1–C_4 straight chain or branched alkyl groups, halogen atoms and an amino group, or a nitro group;

R_5, R_7 and R_9 each independently stand for a hydrogen atom or a methyl group;
R_6 stands for



in which C_1 and C_2 each independently represent a C_1–C_5 hydrocarbon residue,

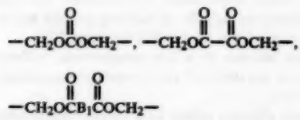




in which D_1 represents —O—, —S—, —NH— or a C_1–C_5 alkylane group,

—SO—, —CO—,

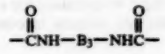
—CH₂—NH—CH₂—,



in which B_1 represents a divalent C_1–C_8 hydrocarbon residue,

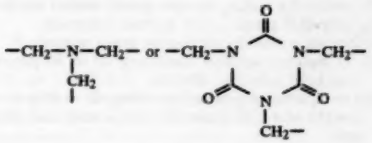
—COB₂OC—

in which B_2 represents a divalent C_1–C_5 hydrocarbon residue, or



in which B_3 represents a divalent C_1–C_3 hydrocarbon residue;
and R_8 represents

in which B_4 and B_5 each independently represents a C_1–C_5 hydrocarbon residue,



4,430,446

PLASTICS FOAM PRODUCTION

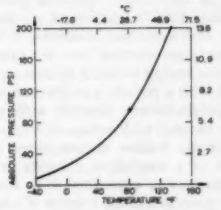
Kenneth C. Lynn, 34 Gilhams Ave., Banstead, Surrey, England

Continuation-in-part of Ser. No. 331,800, Dec. 12, 1981, abandoned, which is a continuation of Ser. No. 90,988, Nov. 5, 1979, abandoned. This application Nov. 19, 1982, Ser. No. 443,040

Claims priority, application United Kingdom, Nov. 6, 1978, 43298/78

Int. Cl.³ C08G *18/14*; B01F *3/04, 5/06*

U.S. Cl. 521—50 **10 Claims**



1. A method of forming a pre-froth plastics foam which comprises the steps of:

mixing the plastics component with a volatile liquid under a pressure sufficient to maintain the volatile liquid in a liquid state;

causing the mixture to flow to a point of use;

maintaining in a first region through which the flow passes a first pressure such that at the temperature prevailing a small but effective quantity of the liquid volatilizes to form vapor bubbles providing nuclei;

causing the flow after passing said first region to undergo a pressure drop to cause volatilization of some but not all of the remaining liquid; and

maintaining in a second region through which the flow passes after the pressure drop a second pressure lower than the first and allowing volatilization of further liquid in said second region.

4,430,447

OPEN-PORE MOLDED ARTICLE BASED ON POLYVINYL ACETALS, AND A PROCESS FOR ITS PREPARATION

Günther Pospich, Frankfurt am Main, and Wolfgang Zimmermann, Kelkheim, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Sep. 30, 1982, Ser. No. 429,035

Claims priority, application Fed. Rep. of Germany, Oct. 31, 1981, 3143272

Int. Cl.³ C08J *9/30*

U.S. Cl. 521—53 **3 Claims**

1. A method for making an open-pored molded article comprising polyvinyl acetal, which method comprises

(A) forming a foam by stirring air into a mixture of

(i) an aqueous solution containing 10 to 50 percent by weight of polyvinyl alcohol,

(ii) an aqueous dispersion containing 40 to 60 percent by weight of a copolymer of vinyl acetate and ethylene, and

(iii) a wetting agent, the ratio by weight of solution (i) to dispersion (ii) being from 100:5 to 100:150,

(B) acetalyzing the polymers in the foamed mixture so produced by mixing therewith an aliphatic aldehyde having one to four carbon atoms, in the presence of an acid, and

(C) permitting the mixture to stand in a closed mold at a temperature from 65° C. to 100° C.

4,430,448

ELASTIC MOLDED BODY COMPRISING A CELL STRUCTURE AND PROCESS FOR PRODUCING SUCH A MOLDED BODY

Philipp Schaefer, Oberstrasse 16; Carsten Picker, Arndtstrasse 24, both of D-3000 Hanover 1, and Helmut Schaefer, Winzlerstrasse 114, D-6780 Pirmasens-Pfalz, all of Fed. Rep. of Germany

Filed Jun. 9, 1982, Ser. No. 386,589

Claims priority, application Fed. Rep. of Germany, Jun. 11, 1981, 3123062

Int. Cl.³ C08J *9/32*

U.S. Cl. 521—54 **15 Claims**

1. An elastic molded body comprising a cell structure and consisting of an elastomeric synthetic plastics material produced by a polyaddition reaction of a liquid diisocyanate or polyisocynate with a reactant containing at least 18 percent by weight polybutadiene selected from the group which consists of polybutadiene having terminal hydroxy groups, a polybutadiene blended with a polyol, a polybutadiene blended with a polyester, a polybutadiene blended with a polyether and a polybutadiene blended with butane-diol-1,4 and having embedded therein elastic hollow microspheres the thin shells of which consist of a vinylidene chloride copolymer and are firmly and unseparably connected with the elastomeric synthetic plastics material and the interior of which contains a gas, said hollow microspheres forming closed cells within the synthetic plastics material.

4,430,449

FAST-COOL VINYL AROMATIC EXPANDABLE POLYMERS

Adolph V. DiGiulio, Wayne, Pa., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Division of Ser. No. 462,158, Jan. 31, 1983, Pat. No. 4,407,979. This application May 16, 1983, Ser. No. 494,828

The portion of the term of this patent subsequent to Oct. 4, 2000, has been disclaimed.

Int. Cl.³ C08V *9/18*

U.S. Cl. 521—56 **4 Claims**

1. Expandable vinyl aromatic polymer particles consisting of vinyl aromatic polymer particles containing dispersed throughout (1) 1 to 10 percent by weight of a thermoplastic, branched, block copolymer of 55–95 weight percent of polymerized vinyl aromatic monomer and 5–45 weight percent of polymerized conjugated diene and (2) a blowing agent; said expandable particles exhibiting fast-cooling properties in molded products produced therefrom.

4,430,450

EXPANDABLE THERMOPLASTIC POLYMER PARTICLES AND PROCESS FOR PRODUCING THE SAME

Kenichi Senda, Akashi, and Masao Nakagawa, Kobe, both of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed May 27, 1983, Ser. No. 499,041

Claims priority, application Japan, May 28, 1982, 57-91898

Int. Cl.³ C08V *9/18*

U.S. Cl. 521—60 **1 Claim**

1. In a process for producing expandable thermoplastic polymer particles, improvement which comprises pelletizing styrene polymer powder obtained by emulsion polymerization and coating or impregnating the resulting pellets with a volatile blowing agent in an aqueous suspension medium containing a suspending agent and a water-soluble inorganic salt selected from the group consisting of calcium chloride, sodium sulfate, magnesium chloride, sodium chloride and mixtures thereof, in a range of from 3 to 20 parts by weight based on 100 parts by weight of the aqueous suspension medium, whereby the amount of inside moisture contained in said particles immediately after preparation is not more than 1% based on the weight of the polymer particle.

4,430,451

LOW DENSITY, MICROCELLULAR FOAMS, PREPARATION, AND ARTICLES

Ainslie T. Young, Los Alamos; Robert G. Marsters, Jemez Springs, and Dawn K. Moreno, Espanola, all of N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Mar. 3, 1982, Ser. No. 354,553

Int. Cl.³ C08J *9/26*

U.S. Cl. 521—64 **9 Claims**

1. A method of forming a machinable composition of matter which after being leached forms a microcellular, low density foam of poly(4-methyl-1-pentene), said method comprising:

(a) forming a mixture of poly(4-methyl-1-pentene) and solvent comprising bibenzyl such that the relative percent by weight of poly(4-methyl-1-pentene) in said mixture is within the range from about 1.0 to about 10.0 and the relative percent by weight of solvent in said mixture is within the range from about 99.0 to about 90.0;

(b) heating said mixture to a first temperature sufficient so that complete solution of poly(4-methyl-1-pentene) and solvent occurs;

(c) cooling said mixture down to a second temperature of about 180° C. and maintaining said second temperature for a period of time sufficient to enable said mixture to come to temperature equilibrium;

(d) then cooling said mixture from about 180° C. at a rate within the range from about 0.9 to about 1.1° C. per minute down to a third temperature of about 160° C., thereby allowing reverse phase separation of said mixture to occur at a particular rate between said second temperature and said third temperature;

(e) holding said mixture at said third temperature for a period of time sufficient to enable said mixture to come to temperature equilibrium; and

(f) then allowing said mixture to cool down to room temperature,

thus solidifying both said poly(4-methyl-1-pentene) and said solvent comprising bibenzyl.

4,430,452

STABILIZER-CONTAINING REACTIVE COMPONENTS FOR PU-FOAMS, NEW STABILIZERS AND A PROCESS FOR PRODUCING THESE STABILIZERS

Hans-Josef Buysch, Krefeld; Hans-Walter Illger, Roesrath, and Karl H. Dorner, Pulheim, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

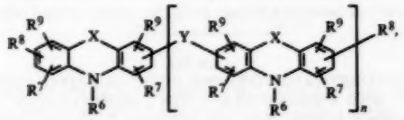
Filed Jul. 6, 1982, Ser. No. 395,552

Claims priority, application Fed. Rep. of Germany, Jul. 14, 1981, 3127750

Int. Cl.³ C08J 9/36

U.S. Cl. 521—107 6 Claims

1. Stabilizer-containing reactive components for the production of polyurethane foams having little or no tendency toward core discoloration, which are based on polyisocyanates, polyols and optionally, water, blowing agents, catalysts, other stabilizers and standard additives, characterized in that said components contain, as stabilizers, monomeric and/or oligomeric derivatives of the diphenylamine series, including the phenothazine series, in stabilizing quantities of from 0.02 to 5%, by weight, of compounds corresponding to the formula:

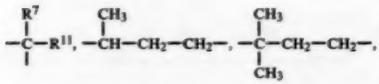


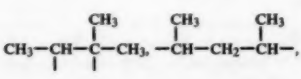
wherein

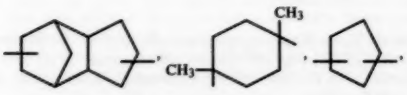
X represents a single bond, $>CH_2$, $\cong CH$, $>S$, $>O$, $>NR^5$,

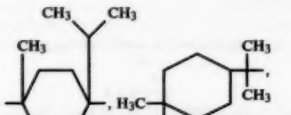
or $>POH$;

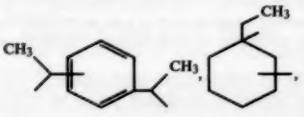
Y represents











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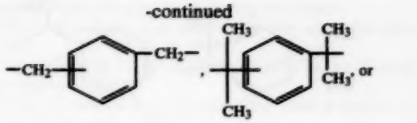
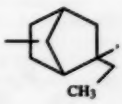
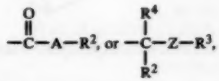




and, up to 60 mole percent, —S—, —CH_2—, —CH-2—S—CH_2— or —CH_2—O—CH_2—;

n represents an integer of from 1 to 29;

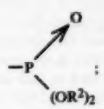
R^6 represents H, or a C_1–C_{18}-alkyl, a C_5–C_{12}-cycloalkyl, a C_5–C_{12}-cycloalkenyl, C_7–C_{18}-aralkyl which may optionally be substituted by OH—, SH—, ether, thioether, carbonic ester, carbonamide and carboxyl groups or which may be interrupted by such groups other than OH, SH and COOH— groups and olefinic double bonds,



wherein

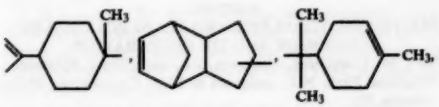
R^2, R^3 and R^4 may be the same or different and represents H, a C_1–C_{12}-alkyl, a C_5–C_{12}-cycloalkyl, a C_5–C_{12}-cycloalkenyl, or a C_7–C_{12}-aralkyl, in addition to which, R^2 represents optionally-substituted aryl and, together with R^4 and the central C-atom, may form a 5- to 12-member aliphatic ring;

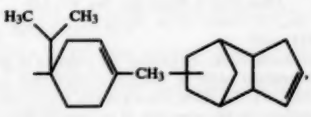
Z represents O, S, NH, NR^5, wherein $R^5 = R^2$, or a radical of the formula CO—A—R^2, wherein A is a single bond, S, O, NH or NR^2, but where R^2 does not form a ring with R^4, or Z together with R^3 also represents



R^7 and R^9 may be the same or different and represent H, CH_3 or C_2H_5;

R^8 represents H, benzyl, styryl, α-methyl-styryl, tert.-butyl, tert.-amyl, isononyl, cyclohexyl, methyl cyclohexyl,





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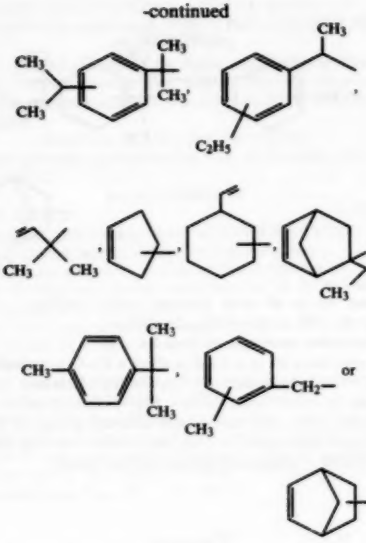


R^{11} represents a C_1–C_7-alkyl, cyclohexyl, cyclohexenyl or aryl.

4,430,453

POLYURETHANE FOAMS SUITABLE FOR HIGH FREQUENCY WELDING AND PROCESS FOR PRODUCING THE SAME

Peter Seifert, Berg.-Gladbach, and Peter Haas, Haan, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Oct. 25, 1982, Ser. No. 436,471

Claims priority, application Fed. Rep. of Germany, Nov. 4, 1981, 3143706

Int. Cl.³ C08G *18/14*

U.S. Cl. 521—107 **9 Claims**

1. A process for the production of polyurethane foams suitable for high frequency welding by the reaction of relatively high molecular weight compounds having molecular weights of from 400 to 10,000 and containing at least two isocyanate-reactive hydrogen atoms with polyisocyanates in the presence of catalysts and blowing agents, characterized in that ammonium salts of phosphorus-containing acids are added to the reaction mixture in an amount of from 0.1 to 10% by weight based on the total weight of the reaction mixture, said phosphorus-containing acids being selected from the group consisting of monoalkylphosphoric acids, dialkylphosphoric acids, dialkylphosphinic acids, monoalkylphosphonic acids, and monoalkylesters of monoalkylphosphonic acids.

4,430,454

POLYMERIC FOAM DERIVED FROM POLYMALEIC ANHYDRIDE AND ITS PREPARATION

Harry M. Castrantas, Newtown, Pa., and Sidney Berkowitz, Highland Park, N.J., assignors to FMC Corporation, Philadelphia, Pa.

Filed May 9, 1983, Ser. No. 493,110

Int. Cl.³ C08G *18/14, 18/62, 18/16, 18/67*

U.S. Cl. 521—107 **46 Claims**

1. A polymeric foam comprising the product of polymaleic anhydride reacted with a hydroxyl-containing compound selected from C_2–C_{10} diols, C_3–C_6 triols, C_4–C_5 tetrasols and their derivatives, in the presence of an organic isocyanate.

4,430,455

N'-(2-HYDROXYALKYL)-N, N, N'-TRIMETHYL-PROPYLENE DIAMINES AS CATALYSTS FOR POLYURETHANE FOAMS

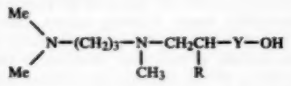
Daniel S. Raden, Hawthorn Woods; Russell O. Carlsen, Barrington, and Kenneth W. Narducy, Bloomingdale, all of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Filed Mar. 9, 1981, Ser. No. 241,816

Int. Cl.³ C08G *18/14, 18/22*

U.S. Cl. 521—118 **5 Claims**

1. The method for manufacturing a polyurethane foam consisting essentially in carrying out the reaction between a polyol and a polyisocyanate in the presence of a catalytic amount of a compound of the formula



wherein R is hydrogen or methyl and Y stands for a single bond or a methylene group.

5. The method of claim 1 wherein said catalyst is used in an amount of between 0.05 and 10.0% by weight of said polyol.

4,430,456

POLYURETHANE-FORMING PROCESS USING AMINO AND AMIDO DIALKYL TIN CARBOXYLATES

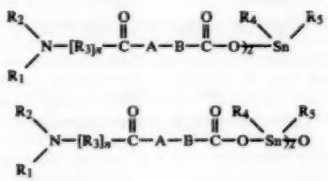
Ibrahim S. Bechara, Boothwyn, and Rocco L. Mascioli, Media, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Division of Ser. No. 230,849, Feb. 2, 1981, Pat. No. 4,360,670. This application Sep. 16, 1982, Ser. No. 418,519

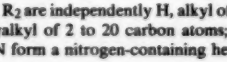
Int. Cl.³ C08G *18/14, 18/24;* C07F *7/22;* C07D *207/00*

U.S. Cl. 521—128 **12 Claims**

1. The method of catalyzing the reaction between an organic isocyanate and an organic compound having at least one active hydrogen containing group, which comprises effecting said reaction in the presence of a catalytic amount of an organotin compound corresponding to either of the formulae set out below:



wherein R_1 and R_2 are independently H, alkyl of 1 to 20 carbon atoms; hydroxyalkyl of 2 to 20 carbon atoms; or R_1 and R_2 together with N form a nitrogen-containing heterocyclic ring of 5 or 6 atoms:

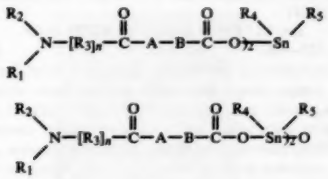


in which n equals zero or one and R_6 is hydrogen or an alkyl or an alkyl hydrocarbyl group of up to 20 carbon atoms;

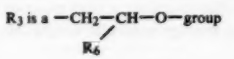
A and B are carbon atoms linked by a single or double bond or together comprise part of a six membered ring from the group consisting of cyclohexane, cyclohexene and benzene;

R_4 and R_5 are independently alkyl groups of 1 to 20 carbon atoms, phenyl or cycloalkyl groups of 6 to 20 carbon atoms.

9. In a premix composition for the preparation of flexible foam comprising:
polyol
methylene chloride
silicone surfactant
water
the improvement comprising a catalytic amount of an organotin catalyst corresponding to either of the formulae below:



wherein R_1 and R_2 are independently H, alkyl of 1 to 20 carbon atoms; hydroxyalkyl of 2 to 20 carbon atoms; or R_1 and R_2 together with N form a nitrogen-containing heterocyclic ring of 5 or 6 atoms;



in which n equals zero or one and R_6 is hydrogen or an alkyl or an alkyl hydrocarbyl group of up to 20 carbon atoms;
A and B are carbon atoms linked by a single or double bond or together comprise part of a six membered ring from the group consisting of cyclohexane, cyclohexene and benzene;
R_4 and R_5 are independently alkyl groups of 1 to 20 carbon atoms, phenyl or cycloalkyl groups of 6 to 20 carbon atoms, said premix being reactable with organic polyisocyanate to form polyurethane.

4,430,457

CLING/STRETCH WRAP COMPOSITIONS

David V. Dobreski, East Windsor, N.J., assignor to Cities Service Company, Tulsa, Okla.

Filed May 10, 1982, Ser. No. 376,892
Int. Cl.³ C08K *5/13*
U.S. Cl. 523—100 **5 Claims**

1. A composition suitable for a cling/stretch wrap film consisting essentially of:
a. from about 90 to 97.5 wt.% of an ethylene polymer selected from the group consisting of ethylene-vinyl acetate copolymers having a vinyl acetate content of from about 3 to about 15 wt.%, low density polyethylene homopolymers, and linear low density polyethylene resins, said ethylene polymer having a melt index value from about 0.2 to about 6.0 and
b. from about 2.5 to about 10 wt.% of an amorphous low molecular weight ethylene-propylene copolymer, the copolymer having an ethylene content of from about 1 to about 7 wt.%, and wherein the ratio of the viscosity of the ethylene polymer to the viscosity of the ethylene-propylene copolymer varies from about 100 to about 100,000.

4,430,458

HYDROGEL-FORMING POLYMERIC MATERIALS

Brian J. Tighe, Birmingham, and Howard J. Gee, Derbyshire, both of England, assignors to Kelvin Lenses Limited, Manchester, England

Filed Oct. 8, 1981, Ser. No. 309,688
Int. Cl.³ C08F *220/20, 226/10;* **C08L** *31/02;* **G02C** *7/04*
U.S. Cl. 523—108 **11 Claims**

1. A contact lens in the form of a hydrogel containing at least 65% by weight of water and comprising a crosslinked polymeric material containing units derived either by simultaneous copolymerization and crosslinking or by copolymerization and subsequent crosslinking of the following monomers:
(1) 20 to 40 mole % of an amide of acrylic or methacrylic acid;
(2) 25 to 55 mole % of an N-vinyl lactam of the N-vinyl pyrrolidone type;
(3) 5 to 20 mole % of an hydroxyalkyl ester of acrylic or methacrylic acid;
(4) 1 to 10 mole % of acrylic or methacrylic acid; and
(5) at least about 5 up to about 10 mole % of a polymerizable hydrophobic vinyl monomer which is at least one monomer selected from the group consisting of vinyl aromatic hydrocarbons of the styrene type and hydrophobic esters of acrylic or methacarylic acid;
the monomers (1) to (5) totalling 100 mole %, the crosslinking having been effected with crosslinking amounts of a crosslinking agent, which, in the case of simultaneous copolymerization and crosslinking, is an ester of a diol and acrylic or methacrylic acid or is divinylbenzene, or, in the case of crosslinking subsequent to copolymerization, is a latent crosslinking agent which is a diamide of an unsaturated aliphatic carboxylic acid, an anhydride of an aliphatic or aromatic carboxylic acid, a diepoxide or dicumyl peroxide, the crosslinking agent having been used in an amount of up to 5 weight % based on the total weight of monomers (1) to (5).

4,430,459

METHOD AND COMPOSITION FOR A FURAN-MODIFIED PHENOLIC NOVOLAK BINDER SYSTEM

Denis W. Akerberg, Huntley; George W. Huffman, Crystal Lake, and Carl A. Rude, Cary, all of Ill., assignors to The Quaker Oats Company, Chicago, Ill.

Division of Ser. No. 194,118, Oct. 6, 1980, Pat. No. 4,348,343. This application Feb. 5, 1982, Ser. No. 346,309
Int. Cl.³ C08K *3/34, 3/04*
U.S. Cl. 523—144 **6 Claims**

1. A free-flowing particulate solid material capable of being integrated into a unitary mass by heat or pressure and capable of being converted into a thermoset unitary mass, comprising:
solid particulate material having coated thereon a furfural solution of a solid non-sticky resin soluble in furfural, wherein the solution has been transformed into an uncured solid thermoplastic condition by reaction of the furfural in the solution with the amine capable of forming a reaction product with the furfural, said amine being used in an amount sufficient to convert the furfural solution to a solid.

4,430,460

PROCESS FOR PREPARING CONDUCTIVE PVC MOLDING COMPOSITIONS

Carl J. Martin, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Continuation of Ser. No. 41,747, May 23, 1979, abandoned. This application Oct. 8, 1982, Ser. No. 433,504
Int. Cl.³ C08L *27/06;* **C08J** *3/20*
U.S. Cl. 523—174 **4 Claims**

1. In a process for mixing low density conductive carbon black particles with polyvinyl chloride resin particles in such amount so that the resultant particulate composition has a bulk resistivity below about 500 ohm-cm at 900 MHz, the improvement which comprises
(a) weighing a first portion of carbon black particles,
(b) dividing the carbon black particles to a particle size of 0.044 millimeter or less,
(c) weighing the polyvinyl chloride resin particles and additives into a high intensity mixer,
(d) transporting the carbon black particles to said mixer in a closed system,

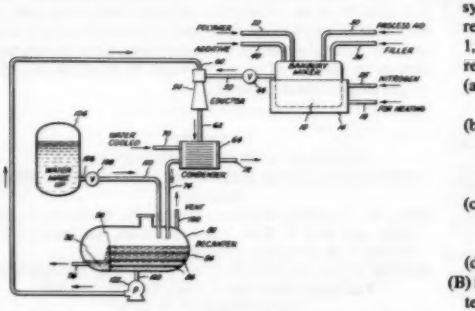
(e) mixing the carbon black with the polyvinyl chloride particles until the carbon black particles are adsorbed,
(f) weighing, dividing and adding another portion of carbon black particles to the mixer,
(g) mixing until the carbon black is adsorbed,
(h) repeating steps (f) and (g) until all of the carbon black has been added to said mixer, and
(i) mixing until all the ingredients are uniformly dispersed and no unadsorbed carbon black is present.

4,430,461

METHOD OF REMOVING VOLATILES IN THE PREPARATION OF SILICONE COMPOSITIONS

Dana F. Deering, Clifton Park, and Edward I. Stein, Ballston Lake, both of N.Y., assignors to General Electric Company, Waterford, N.Y.

Continuation of Ser. No. 155,690, Jun. 6, 1980, abandoned. This application Feb. 11, 1982, Ser. No. 347,808
Int. Cl.³ C08G 77/34; C08J 3/00
U.S. Cl. 523—340 6 Claims



1. An improved process for removing low molecular weight organosilicon volatiles in the mixing of an uncured heat vulcanizable silicone rubber composition consisting essentially of:
(A) mixing:
(a) a diorganopolysiloxane polymer having a viscosity varying from 1,000,000 to 300,000,000 centipoise at 25° C. where the organo groups are monovalent hydrocarbon radicals;
(b) a filler selected from the class consisting of fumed silica and precipitated silica and
(c) a process aid in a Banbury-type mixing vessel which encloses the mixture; said Banbury-type mixing vessel having an external heating jacket, means for adding additional ingredients and means for removing volatile ingredients; and
(B) heating and continually mixing the mixture at 140° to 170° C. for 5 minutes to 30 minutes, the improvement consisting essentially of the additional steps of:
(C) continuously removing the low molecular weight organosilicon volatiles from said mixture by the utilization of aspirator means, said aspirator means being operated by passing effluent through an eductor wherein the suction end of said eductor is connected to the area of said Banbury-type mixing vessel above said mixture;
(D) condensing volatiles entrained in said effluent by cooling said effluent to about room temperature in a condenser means;
(E) separating the condensed volatiles from said effluent by collecting the volatiles in a decantor vessel wherein the condensed volatiles are collected by means of a weir arrangement in the decantor vessel and wherein effluent is recycled to said eductor and new effluent being passed to the decantor vessel as needed; and
(F) removing said condensed volatiles from said decantor vessel for disposal or reuse.

4,430,462

CATHODICALLY DEPOSITABLE AQUEOUS ELECTRO-DIP LACQUER COATING COMPOSITION

Kurt E. Jaeger; Klausjörg Klein; Hans-Peter Patzschke, and Dietrich Saatweber, all of Wuppertal, Fed. Rep. of Germany, assignors to Herberts GmbH, Wuppertal, Fed. Rep. of Germany

Filed Jun. 1, 1982, Ser. No. 384,059
Claims priority, application Fed. Rep. of Germany, Jun. 6, 1981, 3122641
Int. Cl.³ C09D 3/58, 5/40; C25D 13/06
U.S. Cl. 523—402 8 Claims

1. A cathodically depositable aqueous electro-dip lacquer coating composition which contains a synthetic resin binder containing amino groups that can be made soluble in water by protonation with acids, and which optionally contains pigments, fillers, corrosion inhibitors, lacquer auxiliaries, catalysts and-in a quantity of up to 20% by weight, based on the total weight of the coating composition-organic solvents, characterized in that it contains as synthetic resin binder,
(A) from 50 to 99% by weight, based on the total quantity of synthetic resin binder, of one or more amino-1,2-epoxy resins, the amino-1,2-epoxy resins or—where several amino-1,2-epoxy resins are present, the mixture of amino-1,2-epoxy resins
(a) having an average molecular weight (Mn) of from 700 to 10,000,
(b) containing from 0.2 to 3.6 lateral or terminal ethylenic double bonds per 1000 molecular weight units, corresponding to a hydrogenation iodine number of from 5 to 90,
(c) containing primary and/or secondary alcoholic hydroxyl groups corresponding to a hydroxyl number of from 30 to 450 and
(d) having an amine number of from 30 to 150,
(B) from 1 to 50% by weight of a substantially non-acid polyester of a polycarboxylic acid which contains at least 2 terminal or lateral, saturated and/or unsaturated β-hydroxy ester groups per molecule and which has an average molecular weight of from about 1500 to 10,000 and
(C) soluble and/or insoluble transesterification catalysts for the thermal crosslinking of (A) and (B) at temperatures above 140° C.

4,430,463

ACRYLIC POLYMER PORTLAND CEMENT COATING COMPOSITION

Perry D. Mullenax, Youngstown, Ohio, assignor to Michigan Hanger Company, Inc., Hubbard, Ohio

Filed Sep. 15, 1982, Ser. No. 418,579
Int. Cl.³ C08L 33/02, 33/18, 83/04
U.S. Cl. 524—5 6 Claims

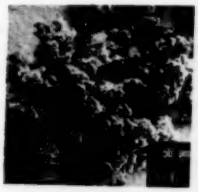
1. An improved coating composition comprising:
(1) between about 5% and about 7% by weight of an aqueous dispersion of an acrylic polymer,
(2) between about 23% to about 38% by weight of a type 1 Portland cement,
(3) 50% by weight sand,
(4) about 0.015% by weight of an aqueous solution of propylene glycol,
(5) approximately 0.2% by weight of a defoaming agent, and
(6) the balance to 100% by weight water, the % by weight based on the total weight of the composition.

4,430,464

PAVEMENT BINDER COMPOSITION

John W. H. Oliver, Glen Iris, Australia, assignor to Australian Road Research Board, Victoria, Australia

Filed Dec. 30, 1981, Ser. No. 335,815
Claims priority, application Australia, Apr. 1, 1981, PE8261
Int. Cl.³ C08L 95/00
U.S. Cl. 524—59 12 Claims



1. A pavement binder composition comprising a digestion of rubber particles in a bituminous material, characterised in that said rubber particles are of the porous nodular surface morphological type which are substantially free of smooth surfaces, and in that said particles have a maximum bulk density of 200 kg/m³.

4,430,465

ASPHALT COMPOSITION

Clifford E. Abbott, Norton, Ohio, assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 22, 1982, Ser. No. 360,303
Int. Cl.³ C08L 95/00; B32B 27/08
U.S. Cl. 524—64 16 Claims

1. A composition comprising (a) asphalt, (b) at least one alkadiene-vinylarene copolymer, (c) at least one petroleum hydrocarbon resin, and (d) at least one antistripping agent; wherein said antistripping agent is a highly branched organic amine.

4,430,466

BENZOTHIAZYL SULFENAMIDES AS SCORCH RETARDANTS FOR MERCAPTOSILANE-COUPLED SILICA FILLED-RUBBER COMPOUNDS

William T. Cooper, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation-in-part of Ser. No. 350,685, Feb. 22, 1982, abandoned. This application Jun. 10, 1982, Ser. No. 387,097
Int. Cl.³ C08K 3/36, 3/34, 5/54, 5/46
U.S. Cl. 524—83 24 Claims

1. A sulfur-vulcanizable rubber compound exhibiting prlonged time-to-scorch comprising at least one sulfur-vulcanizable diene rubber,

a siliceous filler,

a silane coupling agent consisting of a mercaptoalkyltrialkoxysilane coupling agent represented by $(OR)_3SiR^1SH$ wherein R and R^1 each represent an alkyl group of 1 to 10 carbon atoms per molecule, and

a benzothiazyl sulfenamide accelerator at a level of about 2 phr and above.

4,430,467

SELF-EXTINGUISHING PROPYLENE POLYMER

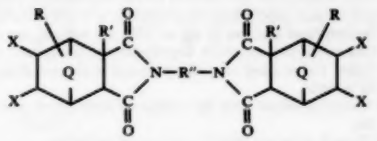
Joseph M. Lesniewski, Hopewell, and Michael J. Breza, Trenton, both of N.J., assignors to Saytech, Inc., Sayreville, N.J.

Filed Jan. 7, 1982, Ser. No. 337,577
Int. Cl.³ C08K 5/01, 5/34
U.S. Cl. 524—89 3 Claims

1. A flame retardant polymer composition comprising:

(a) a polypropylene polymer selected from the group consisting of polypropylene and copolymers containing at least 50% by weight of co-polymerized propylene monomer,

(b) a halogenated aliphatic bisimide corresponding to the formula:



wherein Q is methylene or oxygen, X is chlorine or bromine, R is hydrogen or an alkyl group containing 1–5 carbon atoms, R′ is hydrogen or methyl and R″ is an organic group containing 1–15 carbon atoms and

(c) 2,3-dimethyl-2,3-diphenylbutane.

4,430,468

SURFACTANT-CONTAINING FILLED AND PLASTICIZED THERMOPLASTIC COMPOSITIONS BASED ON ETHYLENE INTERPOLYMERS

Frederick G. Schumacher, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jul. 21, 1982, Ser. No. 400,243
Int. Cl.³ B32B 27/30; C08K 5/01; C08L 23/26, 93/00
U.S. Cl. 524—109 18 Claims

1. A composition comprising (a) from 0 to about 50% by weight of at least one copolymer of ethylene with at least one comonomer selected from the group consisting of vinyl esters of saturated carboxylic acids wherein the acid moiety has up to 4 carbon atoms, unsaturated mono- and dicarboxylic acids of 3 to 5 carbon atoms, salts of said unsaturated acids, and esters of said unsaturated acids wherein the alcohol moiety has 1 to 8 carbon atoms, the ethylene content of said copolymer being from about 40 to about 95% by weight, the comonomer content of said copolymer being from about 5 to about 60% by weight, and the melt index of said copolymer being from about 0.1 to about 400, provided that when said copolymer of ethylene is an ethylene/vinyl ester or ethylene/unsaturated mono- or dicarboxylic acid ester copolymer said copolymer can contain up to about 15 percent by weight of carbon monoxide or sulfur dioxide; provided, that when the olefin polymer of paragraph (e) is absent, the amount of ethylene copolymer is at least about 5% by weight;

(b) from 0 to about 20 percent by weight of at least one plasticizer selected from the group consisting of processing oils, epoxidized oils, polyesters, polyethers, and polyether esters;

(c) from about 40 to about 90% by weight of filler;

(d) from about 0.05 to about 5% by weight of at least one surface active agent selected from the group consisting of alkanol amides; betaine derivatives; block copolymers comprising a series of condensates of ethylene oxide with hydrophobic bases formed by condensing propylene oxide with propylene glycol; ethoxylated compounds comprising alcohols, alkyl phenols, amines and amides; sulfonated derivatives comprising alkyl sulfonates, aryl sulfonates, alkyl-aryl sulfonates, amine and amide sulfonates, olefin sulfonates, sulfosuccinates, sulfonated fatty acid esters, sulfonates of ethoxylated alkyl phenols and of oils and of fatty acids, naphtholene and alkyl naphtholene sulfonates, condensed naphtholene sulfonates, naphthalene and alkyl naphthalene sulfonates and petroleum sulfonates, and dodecyl and tridecyl benzene sulfonates; dodecyl and tridecyl sulfonic acids; sulfates of alcohols, of ethoxylated alcohols, of ethoxylated alkyl phenols, of oils, of fatty acids, of fatty esters, alkaryl sulfates, and sodium, ammonium and amine salts thereof; phosphate derivatives comprising phosphate esters, phosphate alcohol ethoxylates,

phosphate ether ethoxylates, phosphate alkyl acids and phosphate alkyl quaternaries; and quaternary surfactants;

(e) from 0 to about 55% by weight of olefin polymer selected from the group consisting of low density branched polyethylene, high density linear polyethylene, linear copolymers of ethylene and another olefin comonomer, polypropylene and copolymers of propylene and ethylene where the ethylene content is up to 20% by weight provided, that when the ethylene copolymer of paragraph (a) is absent the amount of olefin polymer is at least about 5% by weight;

(f) from 0 to about 50% by weight of elastomeric polymer; and

(g) from 0 to about 30% by weight of tackifier.

4,430,469

PROCESS FOR PREPARING HIGHLY CONCENTRATED AQUEOUS SOLUTIONS OF LOW VISCOSITY OF MELAMINE/ALDEHYDE RESINS

Theodor A. Bürge, Geroldswil; Jürg Widmer, Zurich; Theodor Meyer, Regensdorf, and Ulrich Sulser, Oberengstringen, all of Switzerland, assignors to Sika AG, vorm. Kaspar Winkler & Co., Zurich, Switzerland

Filed Feb. 24, 1982, Ser. No. 351,915

Claims priority, application Fed. Rep. of Germany, Mar. 2, 1981, 3107852

Int. Cl.³ C08L *61/28*

U.S. Cl. 524—247 **19 Claims**

1. A process for preparing highly concentrated aqueous solutions of low viscosity of melamine/aldehyde resins, characterized by reacting to a precondensate in a first step melamine and an aldehyde in an alkaline medium and in the presence of water together with at least one compound (I), selected from the group, consisting of an alkali sulfite, an alkaline earth sulfite, an amino sulfonic acid, an amino carboxylic acid, a hydroxycarboxylic acid, a hydroxycarboxylic acid lactone, and a polyhydroxy carboxylic acid lactone reacting then the thus obtained mixture in a second step with at least one compound (II), selected from the group, consisting of an amino carboxylic acid, a carboxylic acid, a hydroxy carboxylic acid, a hydroxy carboxylic acid lactone, including sulfamic acid, an amino sulfonic acid, a polyhydroxy carboxylic acid and a polyhydroxy carboxylic acid lactone, and then making alkaline the obtained resin solution by adding at least one basic compound (III).

4,430,470

FLAME RETARDANT ADDITIVES BASED ON ALUMINA TRIHYDRATE AND ETHYLENE POLYMER COMPOSITIONS, CONTAINING SAME, HAVING IMPROVED FLAME RETARDANT PROPERTIES

Seiho Taniguchi, Yokohama; Yuichiro Sakuma, Nagareyama, and Tadashi Yoshii, Yokohama, all of Japan, assignors to Nippon Unicar Company Ltd., Tokyo, Japan

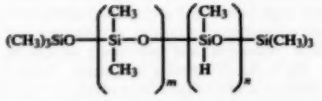
Filed Jun. 30, 1982, Ser. No. 392,782

Claims priority, application Japan, Oct. 8, 1981, 56-159447

Int. Cl.³ C08K *3/22, 5/54*

U.S. Cl. 524—269 **19 Claims**

4. A composition comprising an ethylene polymer, alumina trihydrate having an average particle size of from about 0.01 μm to about 30 μm and a methyl hydrogen polysiloxane of the formula:



wherein m is an integer from 0 to 50 and n is an integer from 10 to 100, said alumina trihydrate being present in an amount of about 25 to 65 percent by weight, based on the total weight of the composition and said polysiloxane being present in an amount of about 0.05 to about 2 percent by weight, based on the weight of the alumina trihydrate.

4,430,471

ELASTOMERS DERIVED FROM THIODIETHANOL HAVING REDUCED ODOR

Richard B. Toothill, Warren; Ignazio S. Megna, Lebanon, and Ajit K. Chaudhuri, Somerville, all of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 28,017, Apr. 6, 1979, abandoned. This application May 24, 1982, Ser. No. 381,493

Int. Cl.³ C08K *5/09, 3/30, 3/28, 3/26, 3/22, 3/16*

U.S. Cl. 524—356 **8 Claims**

1. A composition of matter comprising an elastomer of thiodiethanol having incorporated therein an effective odor reducing amount of a halide, nitrate, carbonate, thiocyanate, sulfide, oxide, acetyl acetonate, ethylacetoacetate or carboxylic acid salt of a metal of Groups IB, IIB or VIII of Medeleeff's Periodic Table of the Elements or mixtures thereof.

4,430,472

ELASTOMERIC COMPOSITIONS WITH IMPROVED CHEMICAL, WATER AND HEAT RESISTANCE

Raymond L. Guzy, Tulsa, Okla., assignor to Hughes Tool Company, Houston, Tex.

Filed Dec. 17, 1982, Ser. No. 450,692

Int. Cl.³ C08K *5/01*

U.S. Cl. 524—483 **2 Claims**

1. In a process of producing a curable elastomeric jacketing composition having improved chemical and heat resistance when cured from an ethylene/acrylic elastomer which is a copolymer of ethylene and methyl acrylate plus a cure site monomer and which has a polymer content of approximately 81% by weight, a specific gravity of 1.12±0.03 and a Mooney Viscosity at 100° of 29±5, the improvement comprising:

the step of blending said ethylene/acrylic elastomer with a polybutadiene having greater than 50% 1,2 polymerized units and having a molecular weight between 1,500 and 25,000 grams/mole.

4,430,473

COMPOSITES MADE FROM THERMOSETTING COMPOSITIONS CONTAINING HEMIFORMALS OF PHENOL

George L. Brode; Sui-Wu Chow, and Warren F. Hale, all of Bridgewater Township, Somerville County, N.J., assignors to Union Carbide Corporation, Danbury, Conn.

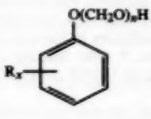
Continuation-in-part of Ser. No. 242,995, Mar. 12, 1981, abandoned. This application Jan. 19, 1982, Ser. No. 340,695

Int. Cl.³ C08K *7/14*

U.S. Cl. 524—492 **4 Claims**

1. A reinforced composite made by a liquid injection molding process said composite comprising from 20 to 70 weight percent of a reinforcing material, based in the weight of the composite, and from 30 to 80 weight percent, based on the weight of the composite, of a liquid thermosetting solution, the solution comprising:

(I) from 40 to 80 weight percent, based on the total weight of the solution, of a hemiformal composition of a phenol having any one of the formulas:



or

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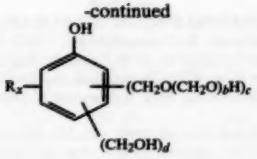

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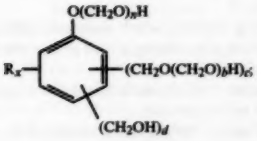


wherein n is a positive number of greater than 1, b is 1 to about 5, and c is 1 to about 3, d is 0 to about 2, the sum of c and d is at least 1 and no greater than 3, the sum of c, d and x is at least 1 and no greater than 5, x is 0 to 3, R is a monovalent radical selected from the group consisting of alkyl from 1 to 18 carbon atoms, cycloalkyl from 5 to 8 carbon atoms, aryl containing from 1 to 3 aromatic rings, aralkyl, alkaryl, alkoxy containing from 1 to 18 carbon atoms, aroxy containing 1 to 3 aromatic nuclei, a halide radical, alkyl sulfides having from 1 to 18 carbon atoms, aryl sulfides having from 1 to 3 aromatic nuclei, and a radical derived from linseed oil or tung oil, wherein x is 0 for at least 50 mole percent, based on the hemiformal composition, of the hemiformal composition; and

(II) from 20 to 60 weight percent, based on the total weight of the solution, of a polymer capable of forming solution with the hemiformal composition of (I), said polymer being from the group; phenol-formaldehyde resoles, phenol formaldehyde novolacs, aromatic polyesters, aromatic polycarbonates, unsaturated polyesters, aromatic polyethers, urea-formaldehyde resins and melamine-formaldehyde resins.

4,430,474

STOVING ENAMEL CONTAINING BLOCKED ISOCYANATES

Horst Schnurbusch; Rainer Gras, both of Herne, and Elmar Wolf, Recklinghausen, all of Fed. Rep. of Germany, assignors to Chemische Werke Huels AG, Marl, Fed. Rep. of Germany

Filed Aug. 13, 1981, Ser. No. 292,689

Claims priority, application Fed. Rep. of Germany, Aug. 13, 1980, 3030554

Int. Cl.³ C08L 67/02

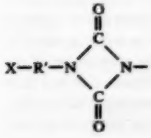
U.S. Cl. 524—590 **5 Claims**

1. A stoving enamel comprising:

a. 40–70% by weight of a mixture of:

(1) a polymer containing hydroxyl groups having a hydroxyl number between 50 and 240 mg KOH/g, and

(2) an isocyanurate-free derivative of isophorone diisocyanate containing blocked isocyanate groups having the formula



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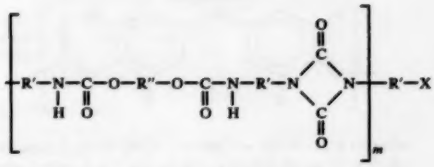
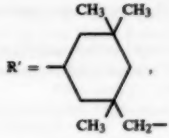


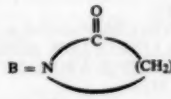
wherein:

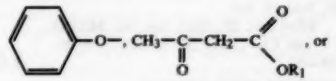
X=—N=C=O or

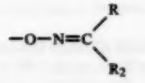
m=0–6,



R″=divalent residue of a diol of 2–12 carbon atoms,







R_1 and R_2=identical or different aliphatic hydrocarbon radicals having 1–4 C-atoms or R_1 and R_2 together with the C-atom bound to the nitrogen atom by a double bond form a cycloaliphatic hydrocarbon ring having 5–6 C-atoms,

wherein said mixture contains 0.8–1.2 equivalents of blocked isocyanate groups per equivalent of hydroxyl group;

b. 0–3% by weight of a cross-linking catalyst; and

c. 30–60% by weight of an organic solvent.

4,430,475

ALKYLATED AROMATIC POLYCARBONATE COMPOSITIONS OF IMPROVED IMPACT STRENGTH

Sivaram Krishnan, Moers, Fed. Rep. of Germany, assignor to Mobay Chemical Corporation, Pittsburgh, Pa.

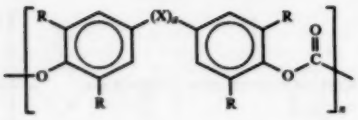
Filed Dec. 31, 1981, Ser. No. 336,211

Int. Cl.³ C08L 69/00

U.S. Cl. 525—67 **3 Claims**

1. A thermoplastic molding composition comprising

(i) a polycarbonate resin characterized in that its structural units conform to



wherein R is $-CH_3$, $-C_2H_5$ or $-CH(CH_3)_2$, X denotes an alkylene or an alkylidene group having 1 to 5 carbon atoms, a cycloalkylene or a cycloalkylidene radical having 5 to 15 carbon atoms, an ether bond or a keto bond, a is either 0 or 1 and n is at least 55 and

(ii) a dispersed acrylic rubber interpolymeric composite comprising

(a) about 25 to 95% by weight of a first elastomeric phase polymerized from about 75 to 99.8% by weight C_1 to C_6 acrylate, about 0.1 to 5% by weight of a cross-linking monomer and about 0.1 to 5% by weight of a graft-linking monomer and

(b) about 75 to 5% by weight of a second, rigid thermoplastic phase,

said composition further characterized in that said (ii) is present at an amount of about 3 to 40 percent relative to the total weight of said (i) plus said (ii).

4,430,476

RESINOUS COMPOSITION COMPRISING A POLYCARBONATE RESIN, A LINEAR LOW DENSITY POLYOLEFIN AND AN ALKENYL AROMATIC COPOLYMER

Ping Y. Liu, Naperville, Ill., assignor to General Electric Company, Mt. Vernon, Ind.

Filed Jan. 29, 1982, Ser. No. 343,949

Int. Cl.³ C08L *23/16, 55/02, 69/00*

U.S. Cl. 525—67 **8 Claims**

1. A composition which comprises

a. from about 35 to 90 weight percent of an aromatic polycarbonate resin;

b. from about 0.5 to 20 weight percent of linear low density polyethylene having a density of from about 0.89 to 0.96 gms/cc; and

c. from about 9.5 to 45 weight percent of an acrylonitrile-butadiene-styrene resin or an acrylonitrile-butadiene-alphamethyl styrene resin;

the weight percent of each of a, b and c based upon the total weight of a, b and c and the impact strength of said composition as measured by the ASTM D-256 double gate test being above about 7.0 ft/lbs.

4,430,477

POLYPROPYLENE COMPOSITION

Kohichi Kunimune, Ichiharashi, Japan, assignor to Chisso Corporation, Osaka, Japan

Filed May 26, 1983, Ser. No. 498,504

Claims priority, application Japan, Jun. 3, 1982, 57-95359

Int. Cl.³ C08L *51/06, 23/12, 23/28*

U.S. Cl. 525—70 **8 Claims**

1. A high-impact polypropylene composition comprising 60 to 95 parts by weight of polypropylene and 40 to 5 parts by weight of a chlorinated polyolefin having styrene graft-polymerized thereon (hereinafter abbreviated to Cl.PO-g-St).

4,430,478

THERMOPLASTIC MOLDING MATERIALS

Burghard Schmitt, 3 Hermannstrasse, 6520 Worms; Klaus Benker, 52 Fuerstenweg, 6730 Neustadt; Edmund Priebe, 7A Bensheimer Ring, 6710 Frankenthal, and Gerhard Lindenschmidt, 11 Buchenweg, 6906 Leimen, all of Fed. Rep. of Germany

Filed Nov. 12, 1981, Ser. No. 320,748

Claims priority, application Fed. Rep. of Germany, Nov. 24, 1980, 3044110

Int. Cl.³ C08L *51/00, 55/02*

U.S. Cl. 525—71 **9 Claims**

1. A molding material which essentially contains

(A) a copolymer, constituting a hard phase, which contains, as copolymerized units,

(a_1) one or more vinyl-aromatic monomers in amounts of from 80 to 60% by weight and

(a_2) one or more ethylenically unsaturated monomers in amounts of from 40 to 20% by weight,

(B) a graft copolymer which contains

(ba) a hard phase and

(bb) an elastomer phase with a number-average particle diameter of from 0.5 to 5 μm, the graft copolymer B containing, as copolymerized units,

(bc) one or more vinyl-aromatic monomers,

(bd) one or more ethylenically unsaturated monomers which make up the hard phase ba and

(be) one or more aliphatic diene monomers, the graft copolymer having been prepared by polymerizing 100 parts by weight of a mixture of the monomers (bc+bd) which form a hard polymer in the presence of from 10 to 20 parts by weight of an elastomeric polymer or copolymer as the grafting base, the said grafting base being dissolved in the monomers (bc+bd), with or without addition of an inert organic solvent, and the said base having been synthesized from the monomers (be), (be)+(bc), or (be)+(bd), where 20 to 50% by weight of the total amount of the monomers (bc+bd) forming a hard polymer have been grafted onto the grafting base and

(C) a graft copolymer which consists of

(ca) a hard phase grafted onto

(cb) an elastomer phase as the grafting base, the latter essentially containing particles of two different sizes with mean number-average diameters,

(cb_1) from 0.05 to 0.18 μm, and

(cb_2) from 0.25 to 0.6 μm, the graft copolymer C containing, as polymerized units,

(cc) one or more vinyl-aromatic monomers,

(cd) one or more ethylenically unsaturated monomers, cc and cd forming said hard phase ca, and

(ce) one or more aliphatic diene monomers, one or more alkyl acrylates with alkyl of 2 to 8 carbon atoms or mixtures of said diene and said alkyl acrylates, the graft copolymer C having been prepared by grafting, in aqueous emulsion, the monomers (cc and cd) forming a hard phase onto a polymer of the monomers (ce), which form an elastomer phase and act as the grafting base, the proportion of (cc) and (cd) being from 20 to 60% by weight, based on the sum of (cc), (cd) and (ce), optionally plus

(D) effective amounts of fillers, pigments, stabilizers, lubricants and slip agents, wherein the copolymer A constitutes from 5 to 80% by weight, and the graft copolymers B+C together constitute from 20 to 95% by weight of the molding material of the sum of A+B+C, and where the proportion of the elastomer phase (cb_1) of the graft copolymer C is less than 60% by weight of the sum of the elastomer phases (cb_1), (cb_2) and (bb), and the weight ratio of the elastomer phases (cb_1) to (cb_2) is from 80:20 to 20:80.

4,430,479

HEAT ACTIVATABLE ADHESIVE WITH IMPROVED TEMPERATURE RESISTANCE

W. Randolph Merton, Stillwater, and Wayne A. Pletcher, Roseville, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 247,251, Mar. 25, 1981, abandoned, which is a continuation of Ser. No. 173,178, Aug. 5, 1980, abandoned, which is a continuation-in-part of Ser. No. 78,596, Sep. 14, 1979, abandoned. This application Dec. 15, 1981, Ser. No. 330,903

Int. Cl.³ C08L *75/04*

U.S. Cl. 525—127 21 Claims

1. A heat activatable thermoplastic adhesive composition comprising: (a) 100 parts by weight of a thermoplastic polymer; (b) about 1 to 100 parts by weight of an organic polymer having a plurality of functional groups available for crosslinking reactions, said organic polymer being selected from the group consisting of hydroxy-substituted polyesters, hydroxylated acrylates and polyamines; and (c) a sufficient amount of crosslinking agent capable of effecting the desired degree of crosslinking of said organic polymer; said adhesive composition exhibiting delayed tack on heat activation and exhibiting high temperature resistance.

4,430,480

TWO-PART COMPOSITION WITH ACTIVATOR ENRICHED WITH DIHYDROPYRIDINE INGREDIENTS

David P. Melody; Seamus M. Grant, and Francis R. Martin, all of Dublin, Ireland, assignors to Loctite Corporation, Newington, Conn.

Filed Nov. 16, 1981, Ser. No. 321,643

Claims priority, application Ireland, Nov. 21, 1980, 2423/80

Int. Cl.³ C08L *61/26*

U.S. Cl. 525—160 6 Claims

1. A two-part adhesive composition comprising

(i) a first part comprising a solution of a chlorosulfonated polyethylene in at least one polymerizable vinyl monomer, a polymerization catalyst, said catalyst comprising at least one free-radical initiator;

and

(ii) A second part comprising an activator composition, the activator composition consisting of condensation reaction products formed by the reaction of butyraldehyde and aniline, said activator composition including at least about 70% by weight of N-phenyl-3, 5-diethyl-2-propyl-1,2-dihydropyridine.

4,430,481

SECONDARY RECOVERY METHOD

Walter D. Hunter, Houston, Tex., assignor to Texaco Development Corp., White Plains, N.Y.

Filed May 3, 1982, Ser. No. 374,203

Int. Cl.³ C08F *8/36*

U.S. Cl. 525—328.4 7 Claims

1. An N-substituted sulfated, ethoxylated acrylamide-diacetone acrylamide copolymer bearing N-substituents of the formula:

$$-(CH_2CH_2O)_eSO_3M$$

wherein e is an integer of from 1 to 6 and M is selected from the group consisting of hydrogen, sodium, potassium and ammonium.

4,430,482

PROCESS FOR SECONDARY RECOVERY

Walter D. Hunter, Houston, Tex., assignor to Texaco Development Corp., White Plains, N.Y.

Division of Ser. No. 246,760, Mar. 23, 1981, abandoned. This application Mar. 22, 1982, Ser. No. 360,941

Int. Cl.³ C08F *8/36*

U.S. Cl. 525—329.4 4 Claims

1. An N-substituted polyacrylamide bearing N-substituents of the formula:

$$-(CH_2CH_2O)_mSO_3M$$

wherein m is an integer of from 1 to 5 and M is selected from the group consisting of hydrogen, sodium, potassium and ammonium.

4,430,483

PROCESS FOR THE PRODUCTION OF WATER-RESISTANT, FILM-FORMING CHLORINATED POLYMERS

Franz Alfes; Hermann Perrey; Karl-Heinrich Meyer, all of Krefeld; Diez Heine, Leverkusen, and Friedrich Kowitz, Dormagen, all of Fed. Rep. of Germany, assignors to Bayer Akiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jan. 21, 1982, Ser. No. 341,232

Claims priority, application Fed. Rep. of Germany, Jan. 27, 1981, 3102511

Int. Cl.³ C08F *8/22*; C08C *19/14, 2/02*

U.S. Cl. 525—356 3 Claims

1. A process for the production of a chlorinated polymer having a chlorine content of from 30 to 70%, by weight, which comprises chlorinating a polymer selected from the group consisting of natural rubber, polyisoprene, polybutadiene, polyethylene, polypropylene, ethylene/propolyene copolymers and mixtures thereof in a chlorinated hydrocarbon solvent, removing the solvent using steam, hot water or a mixture thereof in the presence of at least 1 to 10%, by weight, based on the chlorinated polymer, of an alkoxylation product of 1 mole of a primary aliphatic alcohol containing from 12 to 18 carbon atoms and from 2 to 18 moles propylene oxide and drying the precipitated chlorinated polymer.

4,430,484

POLYESTER-CARBONATE RESIN BLENDS

Clayton B. Quinn, Mount Vernon, Ind., assignor to General Electric Company, Mt. Vernon, Ind.

Continuation of Ser. No. 225,058, Jan. 14, 1981, abandoned. This application Aug. 30, 1982, Ser. No. 412,719

Int. Cl.³ C08L *67/00, 69/00, 77/10, 79/08*

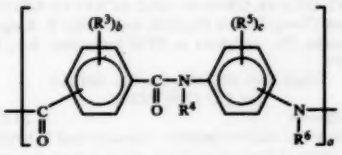
U.S. Cl. 525—425 15 Claims

1. A thermoplastic composition comprising in admixture

(a) an aromatic polyester-carbonate and

(b) an aromatic polyester-carbonate heat distortion improving effective amount of at least one polymer selected from the group consisting of

(i) aromatic polyamide of the formula



wherein

R^3 and R^5 are independently selected from halogen, alkyl of one to twelve carbon atoms, and substituted alkyl wherein the substituent is halogen or OR^7 wherein R^7 is an alkyl of one to ten carbon atoms;

R^4 and R^6 are independently selected from alkyl of one to twelve carbon atoms, hydrogen, aryl of six to eighteen carbon atoms, aralkyl of seven to eighteen carbon atoms, and alkaryl of seven to eighteen carbon atoms;

a is from 10 to abut 500;

b and c are independently selected from an integer of 0 to 4.

(ii) aromatic polyamideimides

(iii) polyimides.

4,430,485
FLAME RETARDANT POLYCARBONATE COMPOSITIONS

Victor Mark, Evansville, Ind., assignor to General Electric Company, Mt. Vernon, Ind.

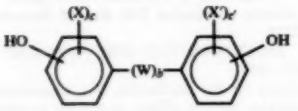
Continuation-in-part of Ser. No. 176,868, Aug. 11, 1980, abandoned. This application Feb. 10, 1982, Ser. No. 347,484

Int. Cl.³ C08G *63/12, 63/62;* **C08L** *67/00*

U.S. Cl. 525—439 **19 Claims**

1. A thermoplastic, amorphous, halogen-free, high molecular weight, aromatic copolyester-carbonate resin comprised of the coreaction products of:

(i) at least one halogen-free and sulfur-free diphenol, of the formula



wherein:

X is independently selected from monovalent hydrocarbon radicals;

X' is independently selected from monovalent hydrocarbon radicals;

W is selected from the group consisting of non-polycyclic divalent hydrocarbon radicals, the —O— radical, and the

radicals;

c and c' are independently selected from whole numbers having a value of from 0 to 4 inclusive; and

b is either zero or one;

(ii) at least one halogen-free thiodiphenol;

(iii) at least one dicarboxylic acid or a polyester forming derivative thereof; and

(iv) a carbonate precursor.

4,430,486
FILM-FORMING URETHANE RESINS CONTAINING ALKOXY SILANE GROUPS AND ACRYLYL GROUPS

Wen-Hsuan Chang; Robert Piccirilli, and Walter F. Kasper, all of Gibsonia, Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Nov. 29, 1982, Ser. No. 445,315

Int. Cl.³ C08F *283/00*

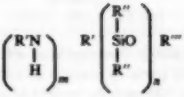
U.S. Cl. 525—44 **18 Claims**

1. An ungelled reaction product characterized in having an acrylyl content of from about 0.2 to about 2 meq. per gram is derived from the reaction of:

(a) a urethane resin having an average of greater than 1 amine reactive acrylyl residue per molecule and a free isocyanate content of up to about 15 percent; and

(b) an amino silane of formula

where X is independently (1) hydrogen, (2) an alkyl, aryl, or cycloalkyl group having from 1 to 10 carbon atoms, or (3)



where R' is independently an alkylene group having from 2 to 10 carbon atoms, m is from 0 to 2, R'' is independently a hydrogen, alkyl, aryl, cycloalkyl, alkoxy, or aryloxy group having from 1 to 8 carbon atoms, n is from 1 to 5 and R''' is an alkyl group having from 1 to 8 carbon atoms, with the proviso at least one X is a radical containing silicon.

4,430,487
SHORTSTOP FOR SYNTHETIC CIS-1,4-POLYISOPRENE

Paul H. Sandstrom, Tallmadge, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Sep. 16, 1982, Ser. No. 418,918

Int. Cl.³ C08F *2/42*

U.S. Cl. 526—83 **7 Claims**

1. An improved polymerization process which comprises polymerizing isoprene under solution polymerization conditions in a hydrocarbon solvent with a catalyst system comprising a mixture of titanium tetrachloride and a trialkylaluminum or a trialkylaluminum etherate compound, wherein the polymerization is shortstopped with 4,7-diaza-decane-1,10-diamine, in an amount of 0.10 to 2.00 parts per hundred (phr) of rubber.

4,430,488
DEACTIVATION OF CATALYST IN SOLUTION PROCESS FOR POLYMERIZATION OF α-OLEFINS

Vaclav G. Zboril, Kingston, Canada, assignor to Du Pont Canada Inc., Mississauga, Canada

Continuation-in-part of Ser. No. 250,904, Apr. 3, 1981. This application Nov. 19, 1982, Ser. No. 443,060

Claims priority, application United Kingdom, Dec. 11, 1980, 8039684

Int. Cl.³ C08F *2/42, 10/02*

U.S. Cl. 526—84 **7 Claims**

1. A solution polymerization process for the preparation of high molecular weight polymers of α-olefins selected from the group consisting of homopolymers of ethylene and copolymers of ethylene and C_3–C_{12} α-olefins, said process comprising feeding monomer selected from the group consisting of ethylene and mixtures of ethylene and at least one C_3–C_{12} α-olefin, a coordination catalyst and inert hydrocarbon solvent to a reactor, said catalyst containing vanadium, polymerizing said monomer at a temperature in the range of 105°–320° C. and a pressure of less than 25 MPa, deactivating the catalyst in the solution so obtained by admixing therewith a solution of a salt of an alkaline earth metal or zinc and an aliphatic monocarboxylic acid having 6 to 12 carbon atoms dissolved in hydrocarbon solvent, said solution containing sufficient excess aliphatic monocarboxylic acid to solubilize said salt, separating hydrocarbon solvent, aliphatic monocarboxylic acid and other volatile matter from the resultant solution and recovering a composition comprising said high molecular weight polymer, the amount of said salt being controlled so that the composition contains less than 5000 ppm of alkaline earth metal or zinc.

4,430,489

ONE-PACKAGE, HEAT-CURABLE SEALANT COMPOSITIONS COMPRISING A BLOCKED POLYISOCYANATE AND A BLOCKED POLYAMINE

MacMillan John H., Ambler; Eugene R. Bertozzi, Yardley, and Bruce E. Streeter, Morrisville, all of Pa., assignors to Thiokol Corporation, Chicago, Ill.

Filed Apr. 28, 1982, Ser. No. 372,587
Int. Cl.³ C08G 18/80
U.S. Cl. 528—45 12 Claims

1. A composition comprising

(A) the reaction product, at temperatures below about 100° C., of

(i) an isocyanate-terminated prepolymer

(ii) an isocyanate blocking agent, and

(B) the reaction product, at temperatures below 100° C., of

(i) an aliphatic polyamine curing agent

(ii) a polyamine blocking agent.

4,430,490

POLYETHER POLYOLS AND THEIR METHOD OF PREPARATION

Herman P. Doerge, Oakmont, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Aug. 10, 1982, Ser. No. 406,814
Int. Cl.³ C08G 18/48
U.S. Cl. 528—77 15 Claims

1. In a process for the preparation of a liquid polyether polyol wherein a polyhydric alcohol is reacted with an alkylene oxide in the presence of an alkaline catalyst, the improvement which comprises treating the polyether polyol with a hydroxy-carboxylic acid adapted to neutralize the alkaline catalyst to provide a soluble neutralized catalyst and produce a clear reaction mixture without otherwise removing the alkaline catalyst from the reaction mixture.

7. A liquid polyether polyol composition containing a salt of a hydroxy-carboxylic acid and an alkaline catalyst used in the preparation of the polyether polyol; the salt being soluble in the polyether polyol.

14. A polyurethane composition comprising the reaction product of an organic polyisocyanate and the polyether polyol composition of any of claims 7, 8, 9, 10, 11, 12 or 13.

4,430,491

POLY(ETHER-AMIDE) POLYMERIC COMPOSITIONS

Billy M. Culbertson, Worthington, and Timothy A. Tufts, Columbus, both of Ohio, assignors to Ashland Oil, Inc., Ashland, Ky.

Filed Sep. 30, 1982, Ser. No. 429,748
Int. Cl.³ C08G 65/40, 69/44, 69/40
U.S. Cl. 528—153 7 Claims

1. A thermosetting polymeric composition prepared by effecting the step-growth polymerization reaction in the melt phase of a first reactant consisting of an oligomer containing a plurality of aromatic hydroxyl groups and a second reactant consisting of a compound having at least two 2-oxazoline groups.

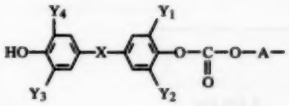
4,430,492

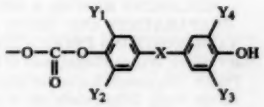
HIGH-MOLECULAR, SEGMENTED, THERMOPLASTICALLY PROCESSABLE, AROMATIC POLYCARBONATES CONTAINING CO-CONDENSED DIMERIC FATTY ACID ESTERS, THEIR PREPARATION AND THEIR USE

Manfred Schreckenberg, Krefeld; Hans-Heribert Burgdörfer, Cologne; Rolf Dhein, Krefeld, and Gottfried Schneider, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 28, 1980, Ser. No. 182,264
Claims priority, application Fed. Rep. of Germany, Aug. 31, 1979, 2935317
Int. Cl.³ C08G 63/62
U.S. Cl. 528—176 7 Claims

1. In a two-phase interfacial process for preparing high-molecular weight, thermoplastically processable aromatic polycarbonates, the improvement comprising co-reacting dimeric saturated fatty acid esters characterized by hydroxyaryl carbonate end groups of the formula

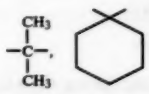




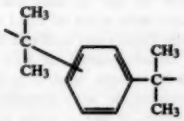
wherein

—O—A—O— is a bivalent diolate radical of an aliphatic dimeric saturated fatty acid ester having hydroxyl end groups and a number-average molecular weight of 1,000 and 15,000

X is a single bond, —CH_2—,



—O—, —S—, —SO_2—, or



and Y_1 to Y_4, independently denote hydrogen, C_1 to C_4 alkyl or a halogen atom with diphenols, monophenolic chain stoppers and carbonic acid halides, said polycarbonates being characterized in that they contain between 5 and 70 weight percent of segments derived from said esters.

4,430,493

PROCESS FOR THE PREPARATION OF AROMATIC POLYESTERS

Werner Rieder, Vienna, Austria, assignor to Isovolta Oesterreichische Isolierstoffwerke Aktiengesellschaft, Wiener Neudorf, Austria

Continuation-in-part of Ser. No. 260,939, May 6, 1981, abandoned. This application Feb. 3, 1983, Ser. No. 463,590

Claims priority, application Austria, May 7, 1980, 2425/80; European Pat. Off., May 7, 1981, 81890076.3

Int. Cl.³ C08G 63/18

U.S. Cl. 528—179 4 Claims

1. In a process for the preparation of aromatic polyesters by a two phase, interfacial polycondensation wherein a fine dispersion is produced from an aqueous phase consisting of a diphenol, approximately an stoichiometric amount of an alkali metal hydroxide and a phase transfer catalyst in a mixture of water and an organic solubilizer and an organic phase of a solution of at least one aromatic dicarboxylic acid halide in a halogenated organic solvent with the polyester being dissolved in the organic phase, the improvement comprising using as the organic solubilizer an alkanol of 2 to 5 carbon atoms or an alkoxy alkanol of 2 to 5 carbon atoms.

4,430,494

MELAMINE RESINS, A PROCESS FOR THEIR PREPARATION AND THEIR USE AND MOLDING COMPOSITIONS PRODUCED FROM THE RESINS

Hans Hönel; Walter Michel, both of Frankfurt am Main; Steffen Piesch, Oberursel; Karin Schlüter, Frankfurt am Main, and Alfons Wolf, Seligenstadt; all of Fed. Rep. of Germany, assignors to Cassella Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Sep. 30, 1982, Ser. No. 429,464

Claims priority, application Fed. Rep. of Germany, Feb. 9, 1981, 3104420

Int. Cl.³ C08G 12/30

U.S. Cl. 528—254 12 Claims

1. A modified melamine-formaldehyde resin in powder form having a melamine:formaldehyde molar ration of 1:(1.27 to 0.7) and a content of 1 to 25% by weight, relative to the total weight of melamine and formaldehyde, with formaldehyde being calculated as 100% strength, of one or more glycol ethers of the formula I

$$R(OCH_2CH_2)_nOH \quad (I)$$

in which R denotes alkyl having 1 to 4 C atoms and n denotes an integer from 1 to 5, and/or of p-toluenesulfonamide.

9. A process for the preparation of the melamine-formaldehyde resins as claimed in claim 1 or 2 which comprises heating melamine in an aqueous solution or suspension with formaldehyde in a melamine:formaldehyde molar ratio of 1:(1.27 to 0.7), preferably 1:(1.25 to 1.01) at a pH value of 8 to 11 and at temperatures of 105° to 160° C. until the finished resin has reached a dilutability with water of 1:(0.1 to 4) at 20° C. and thereafter drying the liquid resin to obtain the resin in powder form and adding before, during or after the condensation reaction, 1 to 25% by weight, relative to the total weight of melamine and formaldehyde, with formaldehyde being calculated as 100% strength, of one or more glycol ethers of the formula I

$$R(OCH_2CH_2)_nOH \quad (I)$$

in which R denotes alkyl having 1 to 4 carbon atoms and n denotes an integer from 1 to 5, and/or of p-toluenesulfonamide.

4,430,495

PROCESS FOR PREPARING LINCOMYCIN AND CLINDAMYCIN RIBONUCLEOTIDES

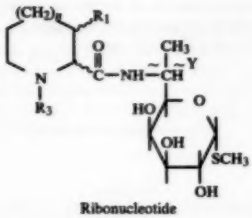
Tom E. Patt, Kalamazoo; Alexander D. Argoudelis, Portage, and Vincent P. Marshall, Kalamazoo, all of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Sep. 17, 1982, Ser. No. 419,244

Int. Cl.³ C07H 15/16

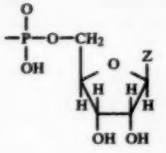
U.S. Cl. 536—16.3 5 Claims

4. A process for preparing 3-(5'-ribonucleotides) of a compound of the of the formula



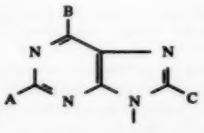
Ribonucleotide

wherein R_1, which can be singly or multiply substituted in the 3, 4, 5, 7, 8 or 9 position of the ring, is selected from the group consisting of hydrogen, alkyl and substituted alkyl wherein the alkyl portion is from 1 to 8 carbon atoms, inclusive, and branched chain isomers thereof, cycloalkyl and substituted cycloalkyl, substituted oxygen, substituted nitrogen, halogen, phenyl, and substituted phenyl, $-(CH_2)_n-OH$, $-(CH_2)_n-NR_4R_5$, and branched chain isomers thereof, wherein n is an integer of from 1 to 8, inclusive, RHD 4 and R_5 are H or alkyl of from 1 to 8 carbon atoms, inclusive, and branched chain isomers thereof; wherein R_3 is selected from the group consisting of H, CH_3, C_2H_5, and $-CH_2-CH_2-OH$; wherein n is an integer of from 1 to 4, inclusive, wherein Y is selected from the group consisting of 7(S)-halo and 7(R)-halo; and the pharmaceutically acceptable salts thereof; wherein the ribonucleotide can be represented by the following formula:

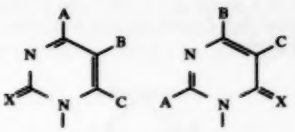


wherein Z can be:

(1) purines of the general formula



(2) pyrimidines of the general formulae



wherein A, B, and C can be alkyl (C_1–C_8); OH, NH_2; —SH; OR; NHR; NR_1R_2; SR; wherein R, R_1 and R_2 are alkyl (C_1–C_8); CN, COOH and NO_2; wherein X is O,S or NH; which comprises contacting resting cell or cell-free extracts of *Streptomyces rochei*, NRRL 3533, with a compound of the above formula, and recovering the desired 3-(5'-ribonucleotide) from the reaction mixture.

4,430,496

STRONG ANION EXCHANGE COMPOSITION AND METHODS

Seth R. Abbott, Concord, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

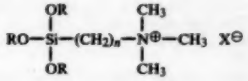
Continuation-in-part of Ser. No. 112,964, Jan. 17, 1980, Pat. No. 4,322,542. This application Mar. 16, 1982, Ser. No. 359,173

The portion of the term of this patent subsequent to Mar. 30, 1999, has been disclaimed.

Int. Cl.³ C07H *17/00*; B01D *15/08*

U.S. Cl. 536—27 **29 Claims**

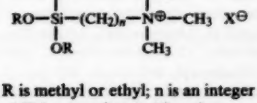
12. A liquid chromatographic column comprising an elongated tube, a strong anion exchange composition packed into said tube, said strong anion exchange composition comprising an inert porous particle having a size of about 5 to 20 microns and having attached to the surface of said inert porous particle by covalent bonding a silyl alkyl ammonium compound having the general formula:



wherein R is methyl or ethyl; n is an integer ranging from 2 to 5; and X is an exchangeable anion, said strong anion exchange composition being capable of simultaneous separation of mixtures of polyfunctional compounds and isomers thereof.

25. A method for the separation of nucleotide isomers on a chromatographic column, the steps of the method comprising:

(a) packing a column with a strong anion exchange composition comprising a microparticulate silica having a particle size of about 3 to about 20 microns which has covalently attached to the silica surface a silyl alkyl ammonium compound having the general formula:



wherein R is methyl or ethyl; n is an integer ranging from 2 to 5; and X is an exchangeable anion;

(b) passing said nucleotide isomer composition through said chromatographic column; and

(c) recovering the separated components.

4,430,497

PROCESS FOR THE PREPARATION OF 2-OXA-BICYCLO [3.3.0] OCTANE DERIVATIVES AND PRODUCTS PRODUCED THEREBY

Werner P. Vollenberg, and Horst R. E. Boehlke, both of Stolberg, Fed. Rep. of Germany, assignors to Gruenenthal GmbH, Stolberg, Fed. Rep. of Germany

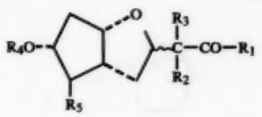
Filed Feb. 17, 1982, Ser. No. 349,678

Claims priority, application Fed. Rep. of Germany, Feb. 26, 1981, 3107248

Int. Cl.³ C07D *307/935*

U.S. Cl. 542—429 **14 Claims**

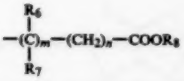
1. Process for the preparation of 2-oxa-bicyclo[3.3.0]octane derivatives having the formula



I

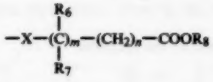
wherein

R_1 is an alkyl radical containing 1 to 5 carbon atoms, or represents the group



in which R_6 and R_7 have the same or a different meaning and each is a hydrogen atom or an alkyl radical containing 1 to 4 carbon atoms or R_6 and R_7 together represent the group $-(CH_2)_p-$ wherein p is four, five or six, and m is zero or one, n is zero, one, two or three and R_8 is an easily removable ester residue, or

is the group $-(CH_2)_q-OR_9$, in which q is one, two or three and R_9 is a member of the group consisting of acetyl, benzoyl, trimethylsilyl, tert.butyl-dimethylsilyl and tert-.butyl-diphenylsilyl, or is an unsubstituted phenyl group or a phenyl group substituted by methyl, ethyl, trifluoromethyl or methoxy or by a group OR_9 in which R_9 has the same meaning as above, or by fluorine, chlorine or bromine or by the group



in which X is a single bond or an oxygen atom and in which R_6, R_7, R_8, m and n have the same meaning as above, or

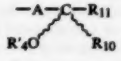
represents together with the radical R_3 the group $-(CH_2-)_r-$ in which r is three, four or five;

R_2 is a hydrogen atom, an alkyl radical containing 1 to 4 carbon atoms or the group $-(CH_2)_s-COOR_8$, in which R_8 has the same meaning as above and s is zero, one or two;

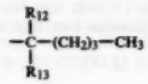
R_3 is a hydrogen atom, an alkyl radical containing 1 to 4 carbon atoms or together with R_1 is the group $-(CH_2)_r$ defined above;

R_4 is an acyl radical, a tri-lower-alkylsilyl group, a tert.butyl-diphenylsilyl group or a triphenylsilyl group and

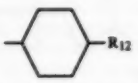
R_5 is the group $-CH_2-OR_4'$ or the group



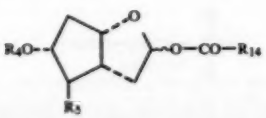
in which groups R_4' within the scope of the definition of R_4 has the same or a different meaning as R_4 has and in which A represents a member of the group consisting of the groups $-CH_2-CH_2-$, (trans)$-CH=CH-$ and $-C\equiv C-$, R_{10} is hydrogen, methyl, ethyl or trifluoromethyl and R_{11} is an alkyl radical of the formula



in which R_{12} and R_{13} have the same or a different meaning and each is hydrogen, methyl or ethyl, or R_{11} is a cyclohexyl radical

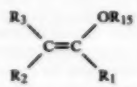


in which R_{12} has the same meaning as above, comprising reacting at temperatures from about $-80°$ C. to about $+60°$ C. a compound of the formula



II

wherein R_4 and R_5 have the same meaning as in formula I and wherein R_{14} represents an alkyl radical containing 1 to 4 carbon atoms or the phenyl group with a compound of the formula

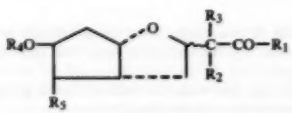


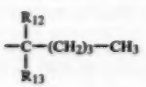
III

wherein R_1, R_2 and R_3 have the same meaning as in formula I and wherein R_{15} represents a trimethylsilyl group or a lower alkanoyl group,

in presence of one or more Lewis acids and in an inert solvent.

14. A compound of the formula:





wherein

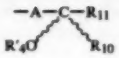
R_3 is hydrogen or alkyl of 1–4 carbons;

R_2 is $COOR_8$ wherein R_8 is methyl or ethyl group; R_4 is alkanoyl containing 1–5 carbon atoms, benzoyl;

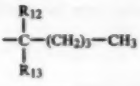
4-phenyl benzoyl, tri-lower alkyl silyl group, a tert-butyldiphenylsilyl group or a triphenylsilyl group;

R_1 is an alkyl radical containing 1–5 carbon atoms, or represents together with the radical R_3 the group $-(CH_2)_r$ in wich r is three, four, or five or is an unsubstituted phenyl group or a phenyl group substituted by methyl, ethyl, trifluoromethyl, fluorine, chlorine or bromine;

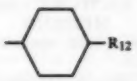
R_5 is the group



in which group R_4' within the scope of the definition of R_4 has the same or a different meaning as R_4 has and in which A represents a member selected from $-CH_2-CH_2-$, (trans)-$CH=CH-$ and $-C\equiv C-$, R_{10} is hydrogen, methyl, ethyl, or trifluoromethyl and R_{11} is an alkyl radical of the formula



in which R_{12} and R_{13} have the same or a different meaning and each is hydrogen, methyl, or ethyl or R_{11} is a cyclohexyl radical



in which R_{12} has the same meaning as above, in the form of their pure isomeric forms or mixtures thereof.

4,430,498

8-OXO-5-THIA-1-AZABICYCLO(4,2,0)OCT-2-ENE COMPOUNDS

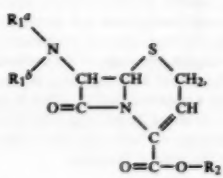
Karl Heusler, Basel; Hans Bickel, Binningen; Bruno Fechtig, Reinach; Heinrich Peter, Riehen, and Riccardo Scartazzini, Allschwil, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 16,598, Mar. 1, 1979, abandoned, which is a continuation of Ser. No. 544,473, Jan. 27, 1975, abandoned, which is a continuation of Ser. No. 188,503, Oct. 12, 1971, abandoned. This application Jan. 23, 1981, Ser. No. 227,832

Int. Cl.[3] **C07D** *501/18;* **A61K** *31/545*

U.S. Cl. 544—16 **4 Claims**

1. A compound selected from the group consisting of 7β-amino-ceph-3-em-4-carboxylic acid compounds of the formula:



(I)

wherein R_1^a and R_1^b are hydrogen, and R_2 is a member selected from the group consisting of hydrogen, 2,2,2-trichloroethyl, 2-chloroethyl, 2-bromoethyl, 2-iodoethyl, phenacyl, 3- or 4-methoxybenzyl, 3,5-dimethoxybenzyl, 2-nitrobenzyl, 4,5-dimethoxy-2-nitrobenzyl, tert.-butyl, tert.-pentyl, benzhydryl, 4,4'-dimethoxybenzhydryl, 2-(4-biphenyl)-2-propyl, 2-furyl, adamantyl, 2-tetrahydrofuryl, 2-tetrahydropyranyl, 2,3-dihydro-2-pyranyl, 4-nitrophenyl, 2,4-dinitrophenyl, 4-nitrobenzyl, trichlorophenyl, pentachlorophenyl, phthaliminomethyl, succinyliminomethyl, trityl, bis-(4-methoxyphenyloxy)-methyl,

benzyl, and lower alkanoyloxymethyl, and alkali metal salts, alkali earth metal salts, or an ammonium salt formed with ammonia, a lower alkylamine, hydroxylower alkylamine, lower alkyleneamine, cycloalkylamine, pyridine, collidine, or quinoline.

4,430,499

7-[2-(2-AMINOOXAZOL-4-YL)-2-(OXIMINO)ACETAMIDO]CEPHALOSPORIN ANTIBIOTICS

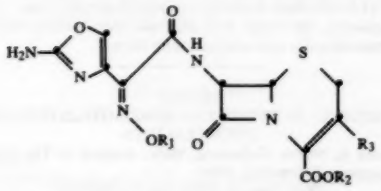
William J. Wheeler, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Sep. 8, 1981, Ser. No. 300,140

Int. Cl.³ C07D *501/36;* **A61K** *31/545*

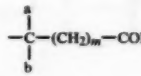
U.S. Cl. 544—25 **21 Claims**

1. A compound of the formula



wherein:

R_1 is hydrogen, C_1 to C_4 alkyl, a carboxy-substituted alkyl or carboxy-substituted cycloalkyl group represented by the formula



wherein m is 0 to 3, a and b when taken separately are independently hydrogen or C_1 to C_3 alkyl, or when taken together with the carbon to which they are attached form a C_3 to C_7 carbocyclic ring; R′ is hydroxy, amino, C_1 to C_4 alkoxy, or —OR″, where R″ is a carboxy protecting group;

or R_1 is a secondary amido group of the formula

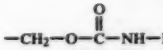
wherein R‴ is C_1 to C_4 alkyl, phenyl or C_1 to C_3 alkyl substituted by phenyl; R_2 is hydrogen, a carboxy protecting group or a pharmaceutically acceptable, non-toxic salt thereof, the hydrates of said salt, or the non-toxic metabolically labile esters thereof;

R_3 is

(a) hydrogen, fluoro, bromo, chloro, hydroxy, or methoxy; or

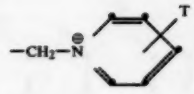
(b) (C_2 to C_4 acyloxy)methyl; or

(c) a methyl carbamate group of the formula



wherein R⁗ is hydrogen or C_1 to C_4 alkyl; or

(d) a methyl pyridinium group of the formula



wherein T is

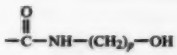
(i) hydrogen, trifluoromethyl, C_1 to C_4 alkyl, C_1 to C_4 alkoxy, hydroxy, cyano, halo or hydroxymethyl; or

(ii) carboxy, C_1–C_4 alkoxycarbonyl, C_1 to C_4 alkanoyl or C_1 to C_4 alkanoyloxy; or

(iii) an amido group of the formula

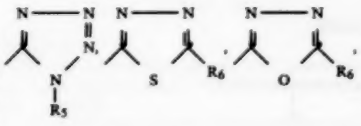
wherein c is hydrogen, methyl, ethyl or cyclopropyl and d is hydrogen, methyl or ethyl; or

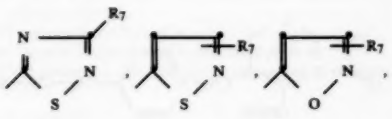
(iv) a group of the formula

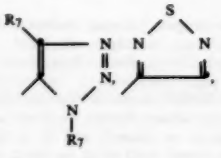


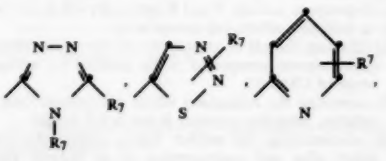
wherein p is 2 to 4; provided that: (a) when the pyridinium ring is substituted with the above substituents in (iv), the pyridinium ring is additionally substituted with R_4, wherein R_4 is hydrogen or C_1 to C_4 alkyl; and (b) when T is hydroxy or halo, T is only bonded to the 3 position of the pyridinium ring; or

(e) a heterocyclic thiomethyl group of the formula —CH₂—S—Y, wherein Y is selected from the group consisting of:









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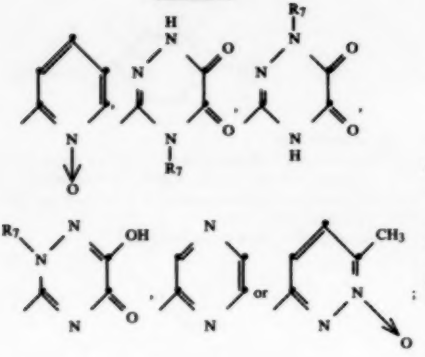


wherein

R_5 is hydrogen, C_1 to C_4 alkyl, $-CH_2COOH$, or $-CH_2SO_3H$;

R_6 is hydrogen, C_1 to C_4 alkyl, phenyl or amino; and

R_7 is hydrogen or C_1 to C_4 alkyl; provided that when R_2 is hydrogen R_3 is not hydroxy.

4,430,500

PROCESS FOR PURIFYING CEPHALOSPORIN COMPOUNDS

Hideomi Saito, Sagamihara; Tomoya Yamamoto; Masayuki Nomura, both of Yokohama, and Tomoyoshi Hachiya, Kunitachi, all of Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

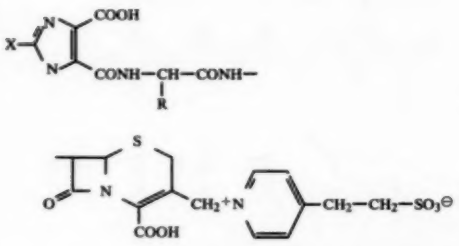
Filed Jun. 15, 1982, Ser. No. 388,656

Claims priority, application Japan, Jun. 16, 1981, 56-92837

Int. Cl.³ C07D *501/04*

U.S. Cl. 544—25 **9 Claims**

1. A method for purifying a cephalosporin compound of the formula:



wherein X is hydrogen, halogen, hydroxy, alkyloxy, phenylalkyloxy, phenyloxy, mercapto, alkylthio, phenylalkylthio, phenylthio, alkylsulfonyl, phenylalkylsulfonyl, phenylsulfinyl, alkylsulfinyl, phenylalkylsulfinyl, phenylsulfinyl, amino, mono- or di-alkylamino, mono- or di-phenylalkylamino, mono- or di-phenylamino, alkanoylamino, a sulfonic acid group, nitro, alkyl, phenylalkyl, or phenyl; and R is hydrogen, alkyl, phenylalkyl, or phenyl, with all of the alkyl, phenylalkyl, and phenyl groups in radicals X and R optionally being substituted with at least one substituent, comprising:

(a) adjusting the pH of an aqueous solution containing said cephalosporin compound to be purified to within the range of 1.0 to 3.5;

(b) removing the compound which precipitates from said solution, whereby a mother liquor is left behind;

(c) concentrating the mother liquor, adding the mother liquor after said concentrating to an organic solvent, isolating the precipitated compound and agitating the obtained compound in an aqueous solution in the presence of an absorbing resin which is a hydrophilic, high molecular weight material having a fine network structure; and

(d) isolating the purified compound.

4,430,501

1,4-BIS(SUBSTITUTED-AMINO)-5,8-DIHYDROXY-ANTHRAQUINONES AND LEUCO BASES THEREOF

Keith C. Murdock, Pearl River, N.Y., and Frederick E. Durr, Ridgewood, N.J., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 63,285, Aug. 2, 1979, Pat. No. 4,278,689, which is a division of Ser. No. 923,602, Jul. 11, 1978, Pat. No. 4,197,249, which is a continuation-in-part of Ser. No. 873,040, Jan. 30, 1978, abandoned, which is a continuation-in-part of Ser. No. 824,872, Aug. 15, 1977, abandoned. This application Nov. 2, 1981, Ser. No. 244,452

Int. Cl.³ C07D *263/06, 265/06*

U.S. Cl. 544—72 **4 Claims**

1. A compound selected from the group consisting of 1,4-bis[2-(1,3-oxazolidin-1-yl)ethylamino]-5,8-dihydroxyanthraquinone, the leuco base and tautomer thereof, and the pharmaceutically acid-addition salts thereof.

4,430,502

PYRIDINYL SUBSTITUTED BENZIMIDAZOLES AND QUINOXALINES

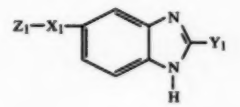
Norman A. Nelson, Galesburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Aug. 13, 1982, Ser. No. 407,853

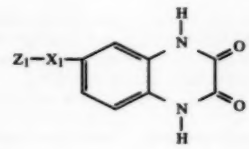
Int. Cl.³ C07D *401/12, 401/06;* **A61K** *31/44*

U.S. Cl. 544—354 **7 Claims**

1. A compound of the formula I or II



I



II

wherein Z_1 is

(a) 4-pyridinyl,

(b) 3-pyridinyl, or

(c) 3-pyridinyl substituted by $(C_1–C_4)$alkyl;

wherein X_1 is

(a) $-(CH_2)_n-$,

(b) $-O-$,

(c) $-CH_2-O-$, or

(d) $-O-CH_2-$;

wherein Y_1 is $-(CH_2)_m-R_7$;

wherein R_1 is hydrogen, a pharmacologically acceptable cation, $(C_1–C_{12})$ alkyl, $(C_3–C_{10})$ cycloalkyl, $(C_7–C_{12})$ aralkyl, phenyl, phenyl mono-, di-, or trisubstituted by chloro, or $(C_1–C_3)$ alkyl, or phenyl para-substituted by

(a) $-NHCO-R_{25}$,

(b) $-O-CO-R_{26}$,

(c) $-CO-R_{24}$,

(d) $-O-CO-(p-Ph)-R_{27}$, or

(e) $-CH{=}N-NH-CO-NH_2$,

wherein R_{24} is phenyl or acetamidophenyl, R_{25} is methyl, phenyl, acetamidophenyl, benzamidophenyl, or amino, R_{26} is

methyl, phenyl, amino or methoxy; and R_{27} is hydrogen or acetamido, and wherein —(p—Ph) is 1,4-phenylene;
wherein R_7 is
(a) $—CH_2OH$,
(b) —CHO, or
(c) $—COOR_1$;
wherein m is an integer of from 0 to 4; and n is an integer of from 1 to 3, inclusive;
including, pharmacologically acceptable acid addition salts thereof, and tautomeric forms thereof.

4,430,503

PREPARATION OF α-DICYANOTRIMETHYLSILYLOXY COMPOUNDS

Kurt Findeisen, Odenthal, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

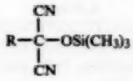
Filed Sep. 23, 1982, Ser. No. 422,514

Claims priority, application Fed. Rep. of Germany, Oct. 13, 1981, 3140632

Int. Cl.³ C07F 7/10

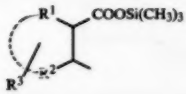
U.S. Cl. 556—417 **8 Claims**

1. A process for the preparation of an α-dicyanotrimethylsilyloxy compound of the formula



in which

R represents an optionally substituted alkyl group having 1 to 8 carbon atoms, an optionally substituted cycloalkyl group having 3 to 12 carbon atoms, an optionally substituted aryl group or an optionally substituted 5- or 6-membered heterocyclic ring, which can additionally be fused with a benzene ring, or a radical of the formula

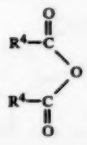


in which

R^1 and R^2 are identical or different and represent a hydrogen atom, an optionally substituted alkyl group having 1 to 8 carbon atoms or together with the adjacent carbon atoms form a cycloaliphatic ring having 1 to 5 carbon atoms or together with the adjacent carbon atoms represent an aromatic or heteroaromatic ring and

R^3 represents a hydrogen or halogen atom or a nitro, alkoxy or carbalkoxy group, a cyclic anhydride radical, an optionally substituted alkyl group having 1 to 8 carbon atoms, an optionally substituted cycloalkyl group which is optionally fused with the aromatic ring formed by R^1 and R^2, an optionally substituted aryl radical which is optionally fused with the aromatic ring formed by R^1 and R^2, or an optionally substituted 5- or 6-membered heterocyclic radical, which is optionally fused with the aromatic ring formed by R^1 and R^2,

comprising reacting a carboxylic acid anhydride of the formula



in which the radicals

R^4 represents an optionally substituted alkyl radical having 1 to 8 carbon atoms, an optionally substituted cycloalkyl radical having 3 to 12 carbon atoms, an optionally substituted aryl radical or an optionally substituted 5- or 6-membered heterocyclic ring, which can additionally be fused with a benzene ring, or both radicals R^4 together represent a radical of the formula

with trimethylsilyl cyanide at a temperature between about 10° and 250° C.

4,430,504

SILYL ETHERS, A PROCESS FOR THEIR PRODUCTION AND THEIR USE AS POLYMERIZATION INITIATORS

Knud Reuter, and Rolf Dhein, both of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

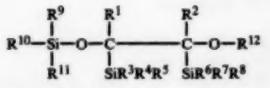
Filed Dec. 10, 1982, Ser. No. 448,732

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1981, 3151444

Int. Cl.³ C07F 7/08, 7/18

U.S. Cl. 556—482 **4 Claims**

1. Silyl ethers corresponding to the formula:



(II)

in which

R^1 and R^2 represent phenyl, tolyl, p-tert.-butyl phenyl, o- and p-chlorophenyl, 2,4-dichlorophenyl, or m-methoxyphenyl,

R^3 to R^8 independently of one another represent methyl, ethyl or phenyl,

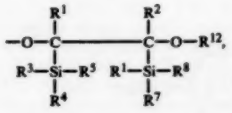
R^9 represents methyl or A,

R^{10} and R^{11} represent chlorine, methyl or A,

R^{12} represents a silyl radical corresponding to the formula:

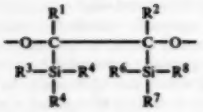
(III)

and A represents a radical corresponding to the formula:



(IV)

the compounds of the formula II optionally containing the partial structure



(V)

from one to twenty times.

4,430,505

PROCESS FOR THE PREPARATION OF N,O-DISUBSTITUTED URETHANES USEFUL FOR THE PREPARATION OF ISOCYANATES

Peter Heitkämper, Dormagen; Klaus König, Leverkusen; Kurt Findeisen, Odenthal; Rudolf Fauss, Cologne, and Rudolf Sundermann, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Oct. 15, 1980, Ser. No. 197,032

Claims priority, application Fed. Rep. of Germany, Oct. 27, 1979, 2943551

Int. Cl.³ C07C *125/065, 125/073*

U.S. Cl. 560—24 15 Claims

1. A process for the preparation of N,O-disubstituted urethanes by reacting

(a) urea or polyurets with

(b) primary amines and

(c) alcohols

at temperatures of from 120° to 350° C. in which N-mono- or N,N'-disubstituted ureas or polyureas are also used as reactants.

11. A process for the preparation of N,O-disubstituted urethanes by reacting

(a) urea or polyurets with

(b) aliphatic primary amines and

(c) alcohols

at temperatures of from 120° to 350° C., characterized in that

(d) N-unsubstituted urethanes and/or

(e) N-mono- or N,N'-disubstituted ureas or polyureas are also used as reactants.

4,430,506

HYDROCARBONYLATION/CARBONYLATION OF ALKYL CARBOXYLATES

Jean Gauthier-Lafaye, Lyons, and Robert Perron, Charly, both of France, assignors to Rhone-Poulenc Industries, Paris, France

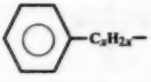
Filed Jul. 6, 1981, Ser. No. 280,219

Claims priority, application France, Aug. 7, 1980, 80 17703

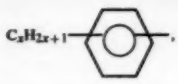
Int. Cl.³ C07C *67/36, 51/12, 45/49, 29/36*

U.S. Cl. 560—105 24 Claims

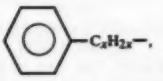
1. A process for the hydrocarbonylation and/or carbonylation of an alkyl carboxylate having the formula R—CO—O—R', in which R represents a linear or branched chain alkyl radical having from 1 to 16 carbon atoms, a cycloalkyl radical having from 3 to 6 carbon atoms, a phenyl radical, a radical



or a radical



with x being an integer ranging from 1 to 6, and R' represents a linear or branched chain alkyl radical having 1 to 5 carbon atoms or a radical



with x being as above defined and further in which R and R' may be the same or different, comprising reacting the alkyl carboxylate with carbon monoxide and hydrogen, in an aqueous medium, in the liquid phase and in the presence of a catalytically effective amount of (i) ruthenium, (ii) cobalt, (iii) at least one iodine-containing promoter, and (iv) vanadium.

4,430,507

4-METHYL-2-OXO-CYCLOPENTANEACETIC ACID PROSTAGLANDIN INTERMEDIATES

Percy Manchand, Montclair, N.J., assignor to Hoffmann-La Roche Inc., Nutley, N.J.

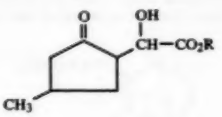
Division of Ser. No. 279,492, Jul. 1, 1981, Pat. No. 4,390,718.

This application Mar. 11, 1983, Ser. No. 474,370

Int. Cl.³ C07C *59/46, 69/732*

U.S. Cl. 560—122 4 Claims

1. A compound of the formula:



wherein R represents hydrogen or a lower alkyl.

4. The compound of claim 1 wherein said compound is alpha-hydroxy-4-methyl-2-oxocyclopentane acetic acid ethyl ester.

4,430,508

SUBSTITUTED TRICYCLODECANE DERIVATIVES, PROCESSES FOR PRODUCING SAME AND ORGANOLEPTIC USES THEREOF

Mark A. Sprecker, Sea Bright, and John B. Hall, Rumson, both of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

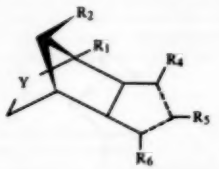
Continuation of Ser. No. 220,628, Dec. 29, 1980, abandoned.

This application Dec. 29, 1981, Ser. No. 335,563

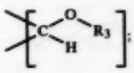
Int. Cl.³ C11B *9/00*; C07C *69/03*

U.S. Cl. 560—256 3 Claims

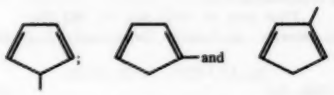
1. A product comprising a major proportion of at least one compound defined according to the structure:



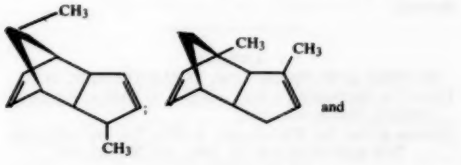
wherein Y is the moiety having the structure:



wherein one of the dashed lines represents a carbon-carbon single bond and the other of the dashed lines represents a carbon-carbon double bond; wherein R_1 and R_2 represent hydrogen or methyl with the proviso that one of R_1 or R_2 is hydrogen and the other of R_1 and R_2 is methyl; wherein R_4, R_5 and R_6 represent hydrogen or methyl with the proviso that one of R_4, R_5 and R_6 is methyl and the other two of R_4, R_5 and R_6 are hydrogen; and wherein R_3 is formyl; produced by the process comprising the step of reacting in the presence of a protonic acid catalyst or a Lewis acid catalyst at least one methyl cyclopentadiene isomer having a structure selected from the group consisting of:

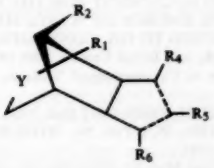


or at least one precursor thereof having a structure selected from the group consisting of:

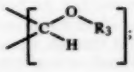


formic acid or a formic acid precursor at a temperature in the range of from about 0° C. up to about 50° C. with the concentration of acid catalyst in the reaction mass varying from 0.01% up to 1 mole % based on the weight of reaction mass.

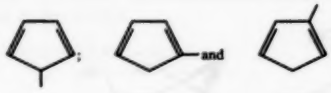
2. A product comprising a major proportion of at least one compound defined according to the structure:



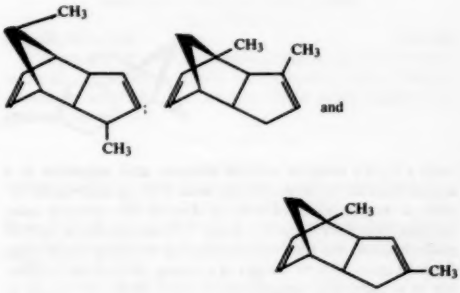
wherein Y is the moiety having the structure:



wherein one of the dashed lines represents a carbon-carbon single bond and the other of the dashed lines represents a carbon-carbon double bond; wherein R_1 and R_2 represent hydrogen or methyl with the proviso that one of R_1 or R_2 is hydrogen and the other of R_1 and R_2 is methyl; wherein R_4, R_5 and R_6 is hydrogen; and wherein R_3 is acetyl; produced by the process comprising the step of reacting in the presence of a protonic acid catalyst or a Lewis acid catalyst at least one methyl cyclopentadiene isomer having a structure selected from the group consisting of:

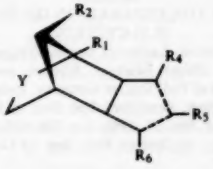


or at least one precursor thereof having a structure selected from the group consisting of:

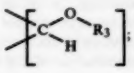


with acetic acid or acetic anhydride at a temperature in the range of from about 0° C. up to about 50° C. with the concentration of acid catalyst in the reaction mass varying from 0.01% up to 1 mole % based on the weight of reaction mass.

3. A product comprising a major proportion of at least one compound defined according to the structure:

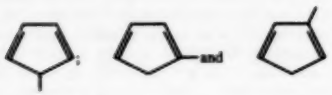


wherein Y is the moiety having the structure:

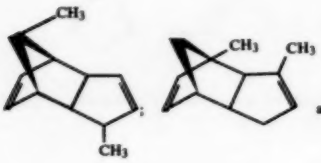


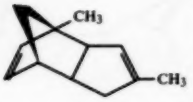
wherein one of the dashed lines represents a carbon-carbon single bond and the other of the dashed lines represents a carbon-carbon double bond; wherein R_1 and R_2 represent hydrogen or methyl with the proviso that one of R_1 or R_2 is hydrogen and the other of R_1 and R_2 is methyl; wherein R_4, R_5 and R_6 represent hydrogen or methyl with the proviso that one of R_4, R_5 and R_6 is methyl and the other two of R_4, R_5 and R_6 is hydrogen; and wherein R_3 is hydrogen; produced by the process comprising the step of reacting in the presence of a protonic acid catalyst or a Lewis acid catalyst at least one

methyl cyclopentadiene isomer having a structure selected from the group consisting of:



or at least one precursor thereof having a structure selected from the group consisting of:





with a C_1–C_2 alkanoic acid or alkanoic acid anhydride at a temperature in the range of from about 0° C. up to about 50° C. with a concentration of acid catalyst in the reaction mass varying from 0.01% up to 1 mole % based on the weight of reaction mass, and then hydrolyzing the resulting esters using from 10 up to 50% by weight of a strong alkali metal hydroxide at a hydrolysis temperature of from about 40° C. up to reflux.

4,430,509

PROCESS FOR THE SEPARATION OF THE RACEMATE (R,S)-CYSTEINE

Horst Bethge, Hanau; Karlheinz Drauz, Freigericht; Axel Kleemann, Hanau; Jürgen Martens, Alzenau, and Horst Weigel, Rodenbach, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

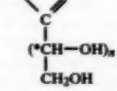
Filed Jan. 25, 1983, Ser. No. 460,858

Claims priority, application Fed. Rep. of Germany, Jan. 26, 1982, 3202295

Int. Cl.³ C07B *19/00*

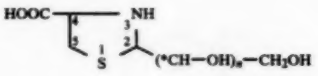
U.S. Cl. 562—401 **22 Claims**

1. A process for the separation of the racemate (R,S)-cysteine comprising condensing the (R,S)-cysteine in a solvent which is water, a water miscible alcohol or ether having up to 5 carbon atoms or a mixture of such solvents with an enantiomerically pure monosaccharide of the formula



(I)

where n is a whole number from 2 to 5 inclusive and *C is an asymmetrical carbon atom to form a 2-position substituted thiazolidin-4-carboxylic acid of the formula



(II)

separating the diastereomers in the mixture obtained from each other and reacting the isolated diastereomer in a solvent which is water, a water miscible alcohol, or ether having up to 5 carbon atoms or a mixture of such solvents with a ring splitting compound containing the group $—NH_2$ and capable of condensing with a carbonyl group and isolating the enantiomerically pure cysteine obtained as such or as the corresponding cystine by oxidation.

4,430,510

PROCESS FOR THE PREPARATION OF 2-(2,4-DICHLOROPHENOXY)-PHENYLACETIC ACID

Jacques Gosteli, Basel, Switzerland, assignor to Schering Corporation, Kenilworth, N.J.

Filed May 24, 1982, Ser. No. 381,250

Claims priority, application Switzerland, Jun. 18, 1981, 4016/81

Int. Cl.³ C07C *59/00, 65/00*

U.S. Cl. 562—465 **20 Claims**

1. A process for the preparation of salts of 2-(2,4-dichlorophenoxy)-phenylacetic acid, comprising reacting a 2-halophenylacetic acid or a salt thereof under basic conditions in the presence of metallic copper with 2,4-dichlorophenol or a salt thereof.

4,430,511

METHOD FOR PRODUCING TEREPHTHALIC ACID

Yulin Wu, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 894,068, Apr. 6, 1978, Pat. No. 4,356,105. This application Aug. 23, 1982, Ser. No. 410,765

Int. Cl.³ C07C *51/347*

U.S. Cl. 562—481 **3 Claims**

1. In a method of producing terephthalic acid wherein potassium benzoate is disproportionated to form dipotassium terephthalate which is converted to terephthalic acid, the improvement comprising:

(a) forming aggregates of crystals of potassium benzoate by the method of direct precipitation;

(b) mixing said aggregates of said crystals with terphenyl to form a low viscosity slurry; and then

(c) transporting said low viscosity slurry to a disproportionation reactor.

4,430,512

PROCESS AND EQUIPMENT FOR THE UTILIZATION OF THERMAL ENERGY OF WASTE HAVING BEEN SUBJECTED TO OIL CONTAMINATION

Gyorgy Vajdovich, and Istvan Csorba, both of Budapest, Hungary, assignors to Csoszereloipari Vallalat, Budapest, Hungary

PCT No. PCT/HU81/00010, § 371 Date Nov. 2, 1981, § 102(e) Date Nov. 2, 1981, PCT Pub. No. WO81/02618, PCT Pub. Date Sep. 17, 1981

PCT Filed Mar. 11, 1981, Ser. No. 320,964

Claims priority, application Hungary, Mar. 11, 1980, 567/80

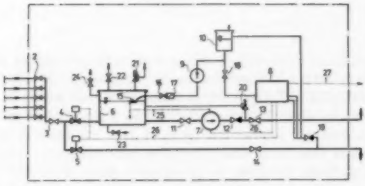
Int. Cl.³ B01D *17/00*

U.S. Cl. 210—745 **3 Claims**

1. A process for recovering the heat content of oil-contaminated waste water, which comprises collecting the waste water and conducting it through a plurality of waste water carrying ducts with shut-off valves, from an oil manipulating system into a single duct with a shut-off valve; a duct with two branches attached to and leading from said shut-off valve; each branch of said branched duct having therein a magnet valve

which operates contrarily to the magnet valve in the other branch; each of said magnet valves connected by means of a cable to an instrument which senses the oil content of the waste water, wherein if the instrument does not sense oil, one magnet valve is open and the other is closed, and if the instrument senses oil, the other magnet valve is open and the one magnet valve is closed; a pressurized sample collector connected via a duct to the one magnet valve intermediate said valve and said sensing instrument; said pressurized collector having therein a sampling place on a float connected by a duct to a sampling vessel which is intermediate said pressurized collector and said sensing instrument; a duct for carrying the waste water from the collector is connected to a shut-off means and a pump which is connected to and controlled by a sensing instrument, transporting the uncontaminated waste water through a check valve for further utilization; and carrying the contaminated waste water through a duct leading from the other magnet valve to an external repository.

2. Apparatus for the utilization of the thermal energy of hot waste water from oil manipulating systems comprising a plurality of waste water carrying ducts with shut-off valves lead-



ing from an oil manipulating system into a single duct with a shut-off valve; a duct with two branches attached to and leading from said shut-off valve; each branch of said branched duct having therein a magnet valve which operates contrarily to the magnet valve in the other branch; each of said magnet valves connected by means of a cable to an instrument which senses the oil content of the waste water, wherein if the instrument does not sense oil, one magnet valve is open and the other is closed, and if the instrumentsenses oil, the other magnet valve is open and the one magnet valve is closed; a pressurized sample collector connected via a duct to the one magnet valve intermediate said valve and said sensing instrument; said pressurized collector having therein a sampling place on a float connected by a duct to a sempling vessel which is intermediate said pressurized collector and said sensing instrument; a duct for carrying the waste water from the collector is connected to a shut-off means and a pump which is connected to and controlled by the sensing instrument for transporting the uncontaminated waste water through a check valve and a duct for further utilization; a duct leading from the other magnet valve for carrying contaminated waste water to en external repository.

4,430,513

ALKYLATION OF AMINE COMPOUNDS

Edwin H. Homeier, Maywood, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Aug. 31, 1981, Ser. No. 297,909
Int. Cl.³ C07C *85/02, 85/00*
U.S. Cl. 564—469 **11 Claims**

1. A process for the self-alkylation of an amine compound which comprises reacting a reactant material consisting of an amine compound containing at least two alkyl substituents at alkylation conditions in the presence of a cobalt carbonyl, a rhodium carbonyl, or a cobalt or rhodium containing compound which is capable of forming a carbonyl under alkylation conditions, and recovering the resultant alkylated amine product.

4,430,514

NOVEL METHOD FOR THE PREPARATION OF CF_3NF_2

Carl J. Schack, Chatsworth, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 21, 1982, Ser. No. 390,160
Int. Cl.³ C07C *87/08*
U.S. Cl. 564—496 **4 Claims**

1. A process for the production of difluoramino trifluoromethane comprising

reacting azidotrifluoromethane with fluorine in equal molar quantities to produce difluoroamino trifluoromethane according to the equation

$$CF_3N_3+F_2 \rightarrow CF_3NF_2+N_2.$$

4,430,515

CATALYST COMPOSITIONS

Rex L. Bobsein, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sep. 7, 1982, Ser. No. 415,201
Int. Cl.³ C07C *2/10*
U.S. Cl. 585—530 **5 Claims**

1. A process of producing olefin polymers in which one or more C_2–C_{20} olefin reactants are contacted with a catalyst consisting essentially of a tantalum halide under oligomerization conditions.

4,430,516

CONVERSION OF OLEFINS TO LOW POUR POINT DISTILLATES AND LUBES

Rene B. La Pierre, Medford, N.J., and Stephen S. Wong, Langhorne, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jun. 21, 1982, Ser. No. 390,099
Int. Cl.³ C07C *2/02*
U.S. Cl. 585—533 **7 Claims**

1. A process for the conversion of olefins to distillate and the range (C_{10}+) hydrocarbons, said process comprising contacting an olefin feed with a high SiO_2/Al_2O_3 ratio large pore crystalline aluminosilicate zeolite catalyst at a pressure in the range of from about 200 psig to about 2000 psig and at a conversion temperature in the range of from about 200°–750° F. and weight hourly space velocity of about 20 to 0.1 wherein the large pore crystalline aluminosilicate zeolite catalyst has pore dimensions of greater than about 6 angstroms and a constraint index of about 0.5 to less than 2.

4,430,517

DEHYDROGENATION PROCESS USING A CATALYTIC COMPOSITION

Tamotsu Imai, Mt. Prospect, Ill., and Chi-Wen Hung, San Rafael, Calif., assignors to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 326,969, Dec. 2, 1981, abandoned. This application Mar. 22, 1983, Ser. No. 477,699
Int. Cl.³ C07C *5/333*
U.S. Cl. 585—660 **3 Claims**

1. A process for the dehydrogenation of a C_2 to C_{30} paraffin hydrocarbon which comprises contacting said hydrocarbon at dehydrogenation conditions with a catalyst comprising from about 0.01 to about 5 wt % of a platinum group component, from about 0.01 to about 5 wt % of a tin component, from about 0.01 to about 15 wt % of an alkali or alkaline earth component and a halogen component while concomitantly maintaining during said process both:

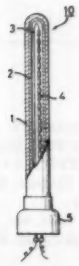
(i) an atomic ratio of said alkali or alkaline earth component to said platinum group component of more than 10, and,

(ii) a halogen content of more than 0.2 wt % and up to 15 wt %.

4,430,518
PROTECTING TUBE FOR THERMOCOUPLE

Takashi Nakajima, Iwatsuki, and Fujio Matsui, Nagareyama, both of Japan, assignors to Denki Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 30, 1981, Ser. No. 326,100
Int. Cl.³ H01L 35/02
U.S. Cl. 136—234 8 Claims

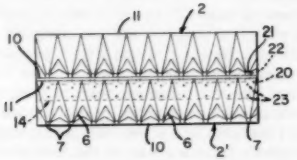


1. A protecting tube for a platinum/platinum-rhodium thermocouple, comprising an outer shell made of a tubular molded body of boron nitride having a density of 1.7 to 2.2 g/cm³ and an inner sheath made of a tubular molded body of ceramics, said outer shell and said inner sheath having one end opening to define a port through which the thermocouple is inserted, said outer shell being formed by the steps of molding boron nitride powders at a temperature of higher than 1500° C. while applying a pressure of from 100 to 500 kg/cm² to form a molded block of boron nitride, cutting out a rod having desired dimensions and shape from said block, and boring said rod to form a cylinder.

4,430,519
ELECTRON BEAM WELDED PHOTOVOLTAIC CELL INTERCONNECTIONS

Walter M. Young, Largo, Fla., assignor to AMP Incorporated, Harrisburg, Pa.

Filed May 28, 1982, Ser. No. 383,061
Int. Cl.³ H01L 31/18, 31/04
U.S. Cl. 136—244 2 Claims

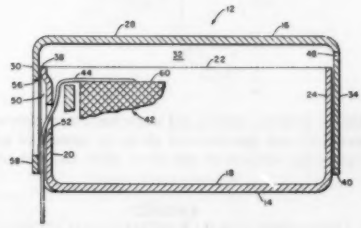


1. A photovoltaic generating module of the type comprising a plurality of elongate photovoltaic cells, each said cell having a light-receiving first surface and an opposed second surface, said surfaces being bounded by parallel opposed elongate first and second edges, said first edge of at least one cell being proximate to the second edge of an adjacent cell, said first surface having a plurality of current collection grids thereon, each grid having a collector pad adjacent said first edge, said pads having a uniform spacing, said at least one cell having electrical connecting means between said collector pads and the second surface of said adjacent cell, characterized in that said interconnecting means comprises a strip of metal foil having opposed first and second surfaces and parallel opposed first and second edges, said first and second surfaces being fully insulated by respective first and second laminas of dielectric material, said strip having tabs extending normally of said first edge, said tabs having a like uniform spacing, said first surface of each said tab having a contact point which is electron beam welded to a respective said collector pad of said at least one cell, said second surface of said strip having a contact point proximate to each said tab which is electron beam welded to said second surface of said adjacent, said contact points being formed by disintegrating said laminas during welding.

4,430,520
TRANSDUCER SHIELDING ENCLOSURE

George C. Tibbetts, and Joseph A. Sawyer, both of Camden, Me., assignors to Tibbetts Industries, Inc., Camden, Me.

Filed Apr. 7, 1982, Ser. No. 366,332
Int. Cl.³ H04R 1/02; H05K 9/00
U.S. Cl. 174—35 R 10 Claims



1. The combination of

a magnetic device having at least one electrical lead and means to produce magnetic flux in response to a current in said lead, and

a magnetic shielding enclosure substantially surrounding said device and comprising fitted inner and outer casings of high permeability magnetic material, each casing comprising a first wall and side walls each integral with and extending from said first wall to an unbroken annular skirt edge, a number of said side walls of each casing having major areas closely fitting with corresponding side walls of the other casing, a side wall of one of said casings having a portion formed away from a corresponding side wall of the other casing and being adapted to provide a clearance space therebetween for said lead extending to the skirt edge of the outer casing, the side wall of the outer casing having a closed aperture located to permit said lead to be threaded out from said clearance space and extended through said aperture.

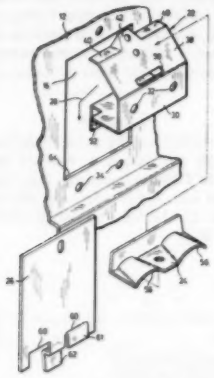
4,430,521
OPTIONAL REAR ENTRY BACK CONNECTOR FOR A BASEBOARD HEATER

L. Ronald Ofield, Islington; Leonhard Puurits, Toronto, and Roy A. Patterson, Mississauga, all of Canada, assignors to Westcan Electrical Manufacturing Inc., Brantford, Canada

Filed Aug. 24, 1981, Ser. No. 295,604
Claims priority, application Canada, Oct. 10, 1980, 362241
Int. Cl.³ F24H 9/02
U.S. Cl. 174—65 R 12 Claims

1. In combination with an electrical heating apparatus having an enclosed terminal section, a rear wall and an aperture in said rear wall permitting access to said terminal section; a back connector assembly comprising: a bracket member including a supporting portion and secured within said terminal section to locate the supporting portion in proximity to said aperture, the bracket member and the aperture being so dimensioned so as to leave a substantial part of the aperture unobstructed, an electrical power cable passing over the bracket member, through the aperture and into the terminal section; a clamping plate clamping said cable between said supporting portion and said clamp-

ing plate, said unobstructed part of said aperture permitting access therethrough to an end of the electric power cable



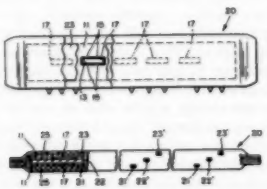
within the terminal section and a notched cover plate covering substantially said aperture and allowing passage of said cable between edge surfaces of said cover plate and said rear wall.

4,430,522

LAMINATED BUS BAR WITH CAPACITORS AND METHOD OF MAKING SAME

Craig C. Bader, Rochester, N.Y., assignor to Eldre Components, Inc., Rochester, N.Y.

Filed Jul. 16, 1982, Ser. No. 398,877
Int. Cl.³ H01B 7/00
U.S. Cl. 174—72 B **9 Claims**



1. A method of producing a laminated bus bar, comprising
providing a resin-coated layer of plastic, dielectric material having therethrough a plurality of spaced openings, and having formed thereon around each opening a plurality of spaced, integral tabs which project part way into the opening,
placing over each of said openings and its associated tabs a thin capacitor, which is similar in configuration to but smaller than the associated opening, and whereby marginal portions of each capacitor at one side thereof are supported on said associated tabs adjacent the inner ends thereof,
partially curing said layer to secure the capacitors thereto, and
laminating said layer and capacitors between a pair of strip conductors to form a bus bar in which said capacitors are secured in said openings with opposite sides thereof engaged with said conductors, and with marginal portions of their peripheries engaged by said inner ends of the associated tabs.

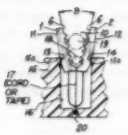
4. A laminated bus bar, comprising
a pair of electrically conductive metal strips,
a layer of dielectric insulation laminated between said strips, and
at least one thin capacitor secured in an opening in said layer with opposite sides thereof in contact with the confronting surfaces on said strips,
said capacitor being generally similar in configuration to and slightly smaller than said opening, and
said layer having formed thereon around the periphery of said opening a plurality of spaced, integral tabs which project into engagement with the periphery of said capacitor at spaced points thereabout.

4,430,523

GRIPPING JAW DEVICE FOR ELONGATED MEMBERS SUCH AS ELECTRICAL CONDUCTORS

Derek Hayes, Home Farm Cottage, St. Michael, Bungay, Suffolk NR35 1NF, England

Filed May 18, 1981, Ser. No. 264,955
Int. Cl.³ H01R 13/58; F16G 11/04
U.S. Cl. 174—135 **22 Claims**



1. The combination of a pair of jaws and a camming means into which the pair of jaws is insertable for the purpose of urging the jaws toward one another in order to locate or grip an elongated member, arbitrarily selected from a range of elongated members of different cross-sectional areas, between confronting faces of the two jaws, wherein said jaws are interconnected by a hinged connection at one end of the jaws, said hinged connection providing a hinging axis which, in use of the jaws, is disposed substantially parallel to the longitudinal direction of said elongated member, and the elongated member-engaging face of at least one of said jaws is provided with a plurality of spaced-apart projections which, when said pair of jaws is inserted into said camming means to bring said faces into confrontation with one another, project toward the elongated member-engaging face of the other jaw, at least some of said spaced-apart projections being in the form of ridges disposed substantially parallel to said hinging axis.

2. The combination of a pair of jaws and a camming means into which the pair of jaws is insertable for the purpose of urging the jaws toward one another in order to locate or grip an elongated member, arbitrarily selected from a range of elongated members of different cross-sectional areas, between confronting faces of the two jaws, wherein said jaws are interconnected by a hinged connection at one end of the jaws, said hinged connection providing a hinging axis which, in use of the jaws, is disposed substantially parallel to the longitudinal direction of said elongated member, and the elongated member-engaging face of at least one of said jaws is provided with a plurality of spaced-apart projections which, when said pair of jaws is inserted into said camming means to bring said faces into confrontation with one another, project toward the elongated member-engaging face of the other jaw, at least some of said spaced-apart projections being in the form of pimples.

4,430,524
BRIDGING CLIP COVER

Donald Santucci, 1708 Shire Ct., Wheaton, Ill. 60187

Filed Mar. 22, 1982, Ser. No. 360,198
Int. Cl.³ H01R 13/44
U.S. Cl. 174—138 F 5 Claims

1. An integral one-piece cover for an electrically conductive bridging clip comprising:

(a) a body having an electrically insulative portion comprised of substantially electrically non-conductive semi-rigid plastic material for enclosing the exposed surfaces of a bridging clip when installed on a terminal block and for preventing unintended electrical contact between adjacent bridging clips on a terminal block; the body having surfaces facilitating manual application of the integral one-piece cover to a bridging clip prior to or after installation thereof on a terminal block; the body including a pair of spaced apart generally facing rectangular sidewalls, each sidewall having an upper edge, a lower edge and two end edges; a bridge disposed between and extending along respective sidewall upper edges, wherein said bridge and sidewalls define a surface having a generally U-shaped cross-section; a pair of opposed partial end walls between adjacent sidewall end edges extending from the bridge downwardly to a point above the sidewall lower edges;

(b) retention means on the body for maintaining firm but selectively releaseable engagement of the one-piece cover with a bridging clip, the retention means including said body sidewalls shaped to closely conform to a bridging clip, the lower sidewall edges being spaced apart a distance less than the upper sidewall edges and less than the width of a bridging clip whereby interfering engagement of closely spaced lower portions of the sidewalls with a bridging clip when positioned within the one-piece cover will function to inhibit outward movement of the bridging clip from the one-piece cover, said pair of opposed partial end walls functioning to maintain the sidewalls, including their lower edges, at said spaced distance.

4,430,525
CIRCUIT ARRANGEMENT FOR CONNECTING TELEX SUBSCRIBER STATIONS TO TELETEX SUBSCRIBER STATIONS WHICH ARE CONNECTED TO THE SAME DATA EXCHANGE SYSTEM

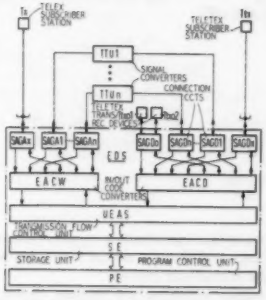
Dietmar Franz, Puchheim, and Norbert Torggler, Munich, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jan. 8, 1982, Ser. No. 338,005
Claims priority, application Fed. Rep. of Germany, Mar. 19, 1981, 3110791
Int. Cl.³ H04L 13/08
U.S. Cl. 178—3 2 Claims

1. In a circuit arrangement of the type in which a data exchange system is connected to both telex and teletex subscriber stations and includes termination circuits for selectively establishing connections therebetween, and at least one signal converter connected to the system via respective termination circuits and operable to convert the digital signals emitted by a telex subscriber station into digital signals which may be processed by a teletex subscriber station and to convert digital signals emitted by a teletex subscriber station into digital signals which may be processed by a telex subscriber station, the improvement in combination therewith comprising:

at least one teletex transmitting/receiving device connected to an individual termination circuit; special call signal generating means operable to produce a special call signal when a subscriber station is not accessible; and

means responsive to a special call signal to cause connection

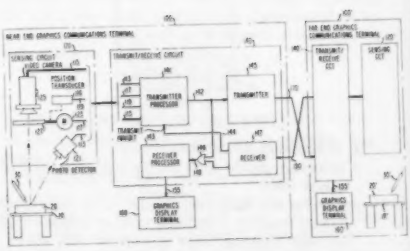


of the teletex transmitting/receiving device for receiving and storing the digital signals transmitted from the accessible subscriber station along with additional items of information identifying the inaccessible subscriber station, and, in response to an inaccessible subscriber station becoming accessible, to interconnect the teletex transmitting receiving device to the previously inaccessible subscriber station in response to the additional items of information for retransmission of the digital signals thereto.

4,430,526
INTERACTIVE GRAPHICS TRANSMISSION SYSTEM EMPLOYING AN ADAPTIVE STYLUS FOR REDUCED BANDWIDTH

Earl F. Brown, Piscataway, and Arthur B. Larsen, Colts Neck, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jan. 25, 1982, Ser. No. 342,112
Int. Cl.³ G08C 21/00
U.S. Cl. 178—18 31 Claims



1. Apparatus for communicating modifications to an image of a previously transmitted graphic, comprising

means responsive to locations of a tip of a stylus with respect to the graphic for specifying addresses of image portions which are to be changed,

means for defining instructions for changing the image of the graphic,

means responsive to said specified addresses and said defined instructions for forming a modification communication, and

wherein said defining means includes means responsive to tilt of the stylus for controlling the production of at least a portion of the defined instructions.

4,430,527

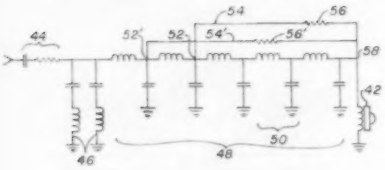
LOUDSPEAKER CROSSOVER DELAY EQUALIZATION

Steven J. Eberbach, 950 Fountain St., Ann Arbor, Mich. 48103

Filed Jun. 3, 1982, Ser. No. 384,193

Int. Cl.³ H04R *3/00*

U.S. Cl. 381—97 **18 Claims**



1. In an audio reproduction system comprising audio transducer means and electric circuit means drivingly connected to said audio transducer means,

said audio reproduction system having a substantially smooth amplitude frequency response characteristic and a time domain sound pressure amplitude response having at least one significant amplitude component less than and occurring before the maximum amplitude response of the transducer means to an input signal to the system,

the improvement characterized by means in the electric circuit means to combine said input signal and at least one earlier replica of said input signal, said earlier replica of less amplitude than said input signal and including a component corresponding to said significant amplitude component and opposite in sense.

4,430,528

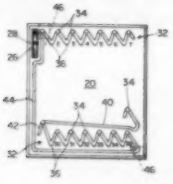
TELEPHONE CALL COUNTER

Norbert A. Kirk, 43 E. Ohio St., Room 930, Chicago, Ill. 60611

Filed Oct. 15, 1981, Ser. No. 311,768

Int. Cl.³ H04M *15/10*

U.S. Cl. 179—7 R **20 Claims**



1. A counting device comprising:

a relatively planar member having opposed ends and opposed sides;

means for attaching said member to an object such that said planar member is inclined relative to horizontal with one of said opposed ends uppermost and above the other opposed end which is lowermost;

a plurality of zigzag tracks arranged in rows in said member with the longitudinal axes of the rows oriented substantially transverse to a line passing through said uppermost and lowermost opposed ends, said zigzag tracks having lowermost peaks which are nearest said lowermost end and uppermost peaks which are nearest said uppermost end, said zigzag tracks further having an uppermost peak at each row end;

a plurality of crossover tracks connecting the uppermost peak at the end of one zigzag track with the lowermost peak at the beginning of a succeeding zigzag track, said uppermost peak at the end and said lowermost peak at the beginning being adjacent opposite sides of said member;

a ball located in one of said zigzag tracks, said ball rolling freely in said zigzag tracks and crossover tracks;

means for keeping said ball in said zigzag tracks and said crossover tracks; and

means for numbering consecutively said lowermost peaks of said zigzag tracks such that where the object is moved in a predetermined fashion to raise said lowermost end above said uppermost end and to return said lowermost end to a position below said uppermost end, said ball advances to the next numbered peak except when the object is additionally rocked in a predetermined manner about a longitudinal axis passing through the opposed ends of said member whereby said ball returns to the same numbered peak.

4,430,529

PIEZOELECTRIC LOUDSPEAKER

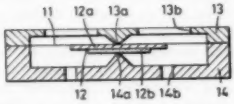
Nobuhiko Nakagawa, and Tsutomu Yoshii, both of Ishikawa, Japan, assignors to Murata Manufacturing Co., Ltd., Japan

Filed Dec. 17, 1981, Ser. No. 331,586

Claims priority, application Japan, Dec. 24, 1980, 55-184898; Feb. 2, 1981, 56-14862

Int. Cl.³ H04R *17/00*

U.S. Cl. 179—110 A **13 Claims**



1. A piezoelectric loudspeaker, comprising:

a frame;

a flexible diaphragm stretched across said frame, said frame supporting said flexible diaphragm along a substantially continuous line defining an outer perimeter along which said flexible diaphragm is kept stationary and free from vibrations;

a bending mode type piezoelectric diaphragm adhered to said flexible diaphragm at a location inside said outer perimeter; and

means for keeping a central portion of said piezoelectric diaphragm stationary and free from vibrations.

4,430,530

TELEPHONY SYSTEM WITH AUTOMATIC TEST CALL GENERATOR FOR REMOTE PORT GROUPS

Ronald J. Kandell, Maitland, Fla.; Donald R. Merriam, Hilton, N.Y.; Bernard H. Root, Longwood, and William W. Woodruff, Maitland, both of Fla., assignors to Stromberg-Carlson Corporation, Orlando, Fla.

Continuation of Ser. No. 295,742, Aug. 24, 1981, abandoned, which is a continuation of Ser. No. 187,277, Sep. 15, 1980, abandoned. This application Nov. 29, 1982, Ser. No. 445,256

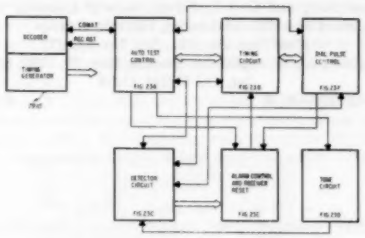
Int. Cl.³ H04M *3/28*

U.S. Cl. 179—175.2 D **32 Claims**

32. Remote test call means for facilitating the testing of a telephone network that includes digital central office means with call processing means that transfer voice data and supervisory data, remote port means connected to remote subscriber lines at a location that is remote from said digital central office means, communications link means between the remote port means and the digital central office means, and interface means connected to said communications link means, and automatic test call means including means for generating a first tone for transfer through the interface means and communications link means to the remote port means, said remote test call means

being connected to the remote port means and the communications link means and comprising:

A. tone generating means responsive to the receipt of a first tone from the automatic test call means for generating a second tone for transfer through said interface means to the automatic test call means, and



B. dial pulse generating means responsive to the completion of the second tone, for generating signals corresponding to dial pulses for transfer through said interface means to the automatic test call means.

4,430,531

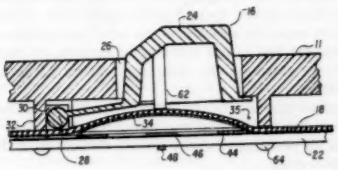
SNAP DISC KEYBOARD

Allen J. Wright, Corvallis, Oreg., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Mar. 15, 1982, Ser. No. 357,961

Int. Cl.³ H01H *13/70*

U.S. Cl. 200—5 A **20 Claims**



1. A keyboard for an electronic device comprising:

an insulative substrate;

a plurality of first conductors supported on the substrate;

a plurality of second conductors supported on the substrate;

a plurality of metal discs each having a central domed portion and a peripheral foot portion formed at an acute angle to the adjacent surface of the domed portion, each metal disc being arranged in a facing relationship with one of the first conductors and the foot portion of each metal disc being supported on the substrate by one of the second conductors;

a strap having tab means for attaching two or more of the metal discs to the strap, each disc being attached to a single strap;

a sheet of resilient material overlaying the plurality of metal discs;

a plurality of keys, each key supported over one of the metal discs for applying force to the disc through the resilient sheet when the key is depressed by a user, wherein the disc snaps and makes contact with the corresponding first conductor in response to applied force, the resilient sheet is compressed by the key and cushions the snap action of the disc for better tactile feel, and the disc snaps back to its original shape when the applied force is removed.

4,430,532

ELECTRONIC WATCH MULTI-CURCUIT PUSHBUTTON SWITCH

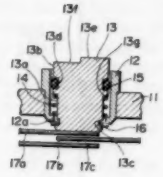
Masataka Matsumoto, Tokorozawa, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan

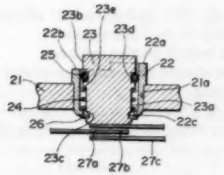
Filed Mar. 12, 1982, Ser. No. 357,475

Claims priority, application Japan, Apr. 14, 1981, 56-52648[U]; Apr. 23, 1981, 56-57912[U]

Int. Cl.³ H01H *35/00, 3/12;* **G04C** *3/00*

U.S. Cl. 200—52 R **10 Claims**





1. A pushbutton device for use on electronic apparatus comprising:

a pipe adapted to be affixed to a casing of said apparatus;

a pushbutton body axially movably disposed in said pipe;

means for returning said pushbutton body to an original position;

means for retaining said pushbutton body in said pipe; and

a plurality of contacts successively actuatable into and out of mutual electrical contact in response to depressed movement of said pushbutton body away from said original position, said pushbutton body or said pipe having at least one step on a surface thereof remote from said contacts to provide a plurality of stepped strokes of depressed movement of said pushbutton body with respect to said pipe for selective actuation of said contacts.

4,430,533

ACTUATOR SWITCH ASSEMBLY

Oskar F. Vatterott, Pacific, Mo., assignor to MCIBS, Inc., Clayton, Mo.

Filed Nov. 27, 1981, Ser. No. 325,095

Int. Cl.³ H01H *3/16*

U.S. Cl. 200—61.41 **5 Claims**

1. A machine and actuator switch assembly comprising:

a machine having two relatively movable parts, and an actuator switch assembly including:

a first switch portion attached to one of said relatively movable parts in adjustable relation, the first switch portion having a spring loaded plunger,

a second switch portion attached to the other of said relatively moving parts, the second switch portion having a spring loaded plunger engageable with the spring loaded plunger of the first switch portion, and

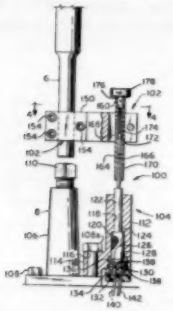
one of said first and second switch portions having a pair of electrical contacts, selectively closed by operative engagement between the spring loaded plunger of the

first switch portion and the spring loaded plunger of said second switch portion,

the first switch portion includes:

a bracket attached to said one of said relatively movable parts, and

a housing attached to the bracket in threadedly adjustable



relation, the spring-loaded plunger being slidably mounted in the housing, and

the second switch portion includes:

a bracket attached to said other of said relatively movable parts, and

a housing attached to the bracket, the spring-loaded plunger being slidably mounted in the housing.

4,430,534

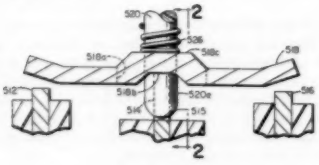
SWITCH CONSTRUCTION

Richard W. Sorenson, Avon, Conn., assignor to Carlingswitch, Inc., West Hartford, Conn.

Continuation-in-part of Ser. No. 328,828, Dec. 9, 1981, Pat. No. 4,389,352, which is a division of Ser. No. 234,664, Feb. 17, 1981, Pat. No. 4,347,417. This application Mar. 16, 1983, Ser. No. 475,953

Int. Cl.³ H01H *5/06*

U.S. Cl. 200—68.3 **3 Claims**



1. A "center-off" switch comprising a base defining an upwardly open cavity, at last three fixed contacts spaced along the bottom wall of said cavity, said switch having means defining actuator support regions, an actuator including support means cooperating with said support regions to movably support said actuator, said actuator including a depending post portion, a movable contact element slidably received inside said base cavity for movement generally across the upper ends of said fixed contacts to selectively bridge certain of them, said movable element having at least one upwardly open recess to receive the lower end of said actuator post portion, said element being moved in response to actuator movement, a spring retained by said actuator post portion to bias said element toward said fixed contacts, said fixed contacts including a center contact with an upper end shaped to receive a central recess in the underside of said element in a "center-off" element position wherein said other fixed contacts do not engage said movable contact element, and said element having generally flat lands on either side of said actuator post recess for engagement with the lower end of said spring, said spring lower end also being generally flat to provide a stable "center-off" position for said movable element.

4,430,535

DAMPING DEVICE FOR ELECTRIC CIRCUIT BREAKERS

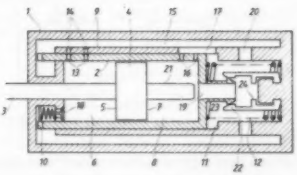
Samuel Berg, and Carl E. Sölver, both of Ludvika, Sweden, assignors to ASEA Aktiebolag, Västerås, Sweden

Filed Nov. 20, 1981, Ser. No. 323,572

Claims priority, application Sweden, Nov. 27, 1980, 8008317

Int. Cl.³ H01H *35/38*

U.S. Cl. 200—82 R **4 Claims**



1. A damping device for electric circuit breakers, said damping device comprising: a housing (1) filled with a damping liquid, a damping cylinder (2) within said housing, said cylinder being movable in its axial direction,

a piston (4) within said cylinder, said piston being connectible to the movable contact of a circuit breaker and being movable between a first end position and a second end position, said first and second end positions corresponding to the closed and open positions of the circuit breaker, respectively, said piston limiting two cylinder spaces (6, 8) positioned on opposite sides of the piston and having restricted outlet openings (13, 16), a spring means (12) for biasing said damping cylinder axially, said damping cylinder being moved by said piston against the action of said spring means to a lock position when said piston is moved from said first to said second end position, latching means (22) for retaining the damping cylinder (2) in said lock position,

said outlet openings of the cylinder space on that side of the piston facing said first end position being blocked in said locking position, whereby reverse movement of the piston is prevented.

4,430,536

VACUUM INTERRUPTER

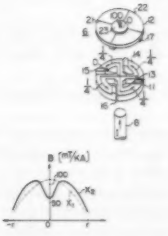
Yukio Kurosawa; Akira Wada; Kiyoji Iwashita, and Hideaki Tsuda, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 18, 1982, Ser. No. 389,969

Claims priority, application Japan, Jun. 24, 1981, 56-96523

Int. Cl.³ H01 *33/66*

U.S. Cl. 200—144 B **6 Claims**



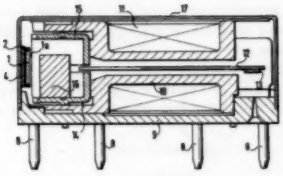
1. A vacuum interrupter comprising:

a vacuum vessel;
at least a pair of electrical conductor rods extending from interior to exterior of said vacuum vessel; and
a pair of separable composite electrodes respectively connected to said electrical conductor rods within said vacuum vessel, each of said composite electrodes having a main electrode and parallel magnetic field generator means for generating a magnetic field substantially parallel to an arc developing between the main electrodes when one main electrode is separated from the other in response to movement of one of said electrical conductor rods so as to extinguish the arc,
in which each of said main electrodes has, at a central portion on its major surface, magnetic field suppressing means which projects toward the opposing main electrode to cancel partly the parallel magnetic field near the central portion.

4,430,537
GETTER AND ELECTRICAL SWITCHING SYSTEM USING SUCH GETTER

Hans Sauer, Fichtenstrasse 5, D-8024 Deisenhofen, Fed. Rep. of Germany; Takashi Takada, Shijonawate, and Yukihiro Kondo, Hirakata, both of Japan, assignors to Hans Sauer, Deisenhofen, Fed. Rep. of Germany

Filed Mar. 30, 1982, Ser. No. 363,584
Claims priority, application Japan, Mar. 31, 1981, 56-48766; Fed. Rep. of Germany, Jan. 8, 1982, 3200392
Int. Cl.³ H01H 9/04
U.S. Cl. 200—302.1 **15 Claims**

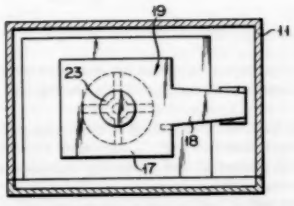


1. A getter for use in a sealed contact chamber, consisting of a porous getter material adapted to adsorb substances capable of creating resistive films on electrical contacts, the majority of the pores in said getter material having diameters greater than 3 nm and smaller than 100 nm, the pore diameter mean value ranging from about 7 nm to about 20 nm.

4,430,538
HIGH-FREQUENCY HEATING DEVICE

Yukio Suzuki, and Syozo Kobayashi, both of Fuji, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha

Filed Aug. 19, 1981, Ser. No. 294,419
Claims priority, application Japan, Aug. 28, 1980, 55-122212[U]; Nov. 11, 1980, 55-161054[U]; Nov. 11, 1980, 55-161056[U]
Int. Cl.³ H05B 6/72
U.S. Cl. 219—10.55 F **16 Claims**

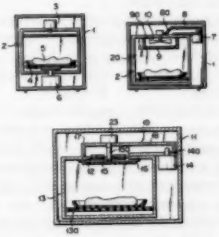


1. A high-frequency heating device comprising:
a housing;
a heating chamber within said housing, said heating chamber having an opening therein for the introduction of high-frequency energy into the heating chamber;
a high-frequency generator;
means for transmitting high-frequency energy from said generator to said opening in said heating chamber;
a rotating disk, mounted for rotation within said opening, for guiding energy from said transmitting means into said heating chamber, said disk having a base plate made of a low dielectric loss material and a plurality of high-frequency screening pieces arranged on the base plate and defining high-frequency exciting slots between the screening pieces which extend radially from the central axis of the base plate to the outer circumference thereof so that a distribution of high-frequency energy across said opening has a maximum value at a central axis of said opening and is supplied therethrough to said heating chamber; and
driving means for rotating said rotating disk.

4,430,539
HIGH-FREQUENCY HEATING DEVICE

Yukio Suzuki, Fuji, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Nov. 5, 1981, Ser. No. 318,560
Claims priority, application Japan, Nov. 11, 1980, 55-161055[U]
Int. Cl.³ H05B 6/72
U.S. Cl. 219—10.55 F **10 Claims**



1. A high-frequency heating device comprising:
a housing;
a heating chamber housed in said housing, said heating chamber having an opening therein;
a high-frequency generator;
means for transmitting high-frequency energy from said generator to said opening in said heating chamber;
a rotating disk guiding the energy mounted for rotation within said opening, said disk having a base plate made of a low dielectric loss material and a plurality of high-frequency screening pieces arranged on the base plate and defining high-frequency exciting slots between the screening pieces which extend radially from the central axis of the base plate to the outer circumference thereof so that a distribution of high frequency energy across said opening has a maximum value at a central axis of said opening and is supplied therethrough to said heating chamber;
means for spacing said screening pieces a predetermined distance from said base plate; and
driving means for rotating said rotating disk.

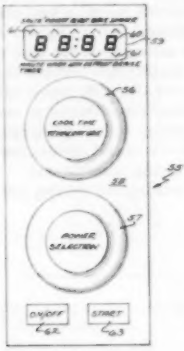
4,430,540
DATA INPUT APPARATUS FOR MICROWAVE OVEN CONTROLLERS

Gerald W. Scalf, Johnson City, Tenn., assignor to Texas Instruments Incorporated, Dallas, Tex.

Continuation-in-part of Ser. No. 274,017, Jun. 15, 1981, abandoned. This application Dec. 28, 1981, Ser. No. 335,022

Int. Cl.[3] **H05B** *6/68;* **G09G** *3/00*

U.S. Cl. 219—10.55 B **14 Claims**



1. Cooking data display apparatus for displaying actual cooking data for a microwave oven control having digital electronic processor means for providing an output to energize a magnetron and having a plurality of cooking data inputs to effect such output comprising

means to provide power to the processor means,

analog input means indicative of selected cooking control parameters, said analog input means including a potentiometer having a rotatable shaft,

means converting an analog signal from the analog input means to a digital signal to input to the processor means as cooking data inputs,

feedback means to effect rotation of said rotatable shaft as an indication of the fulfillment of a cooking control parameter, said feedback means including motor means coupled to the shaft to turn the shaft in either of two opposite directions,

means to energize the motor means,

the processor means including means to monitor the position of the said potentiometer shaft through the means converting an analog signal to a digital signal, and

means to compare the position of the shaft to stored cooking control parameters to energize the motor in response to said comparison to display actual cooking data.

4,430,541
COMBINATION MICROWAVE GAS CONVECTION OVEN

William J. Day, Jr., Allentown, Pa., assignor to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 225,078, Jan. 14, 1981, abandoned. This application Dec. 6, 1982, Ser. No. 447,359

Int. Cl.[3] **H05B** *6/64*

U.S. Cl. 219—10.55 R **4 Claims**

1. A combination microwave gas convection oven comprising:

a microwave cavity having a bottom with an opening;

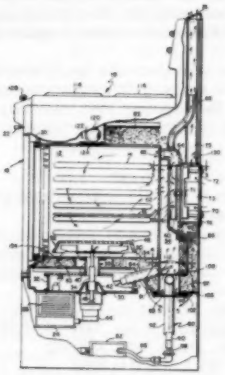
a magnetron positioned below said cavity;

a waveguide for coupling microwave energy from said magnetron to said cavity through said opening;

a chamber positioned behind the back wall of said cavity and communicating therebetween by a plurality of perforations in said back wall, said chamber having a floor with an aperture;

means for recirculating air between said chamber and said cavity, said recirculating means comprising an outlet vent for exhausting a small percentage of recirculating air from said oven, said recirculating means creating a slight negative pressure in said chamber wherein an induced draft is provided into said chamber through said aperture;

a tubular gas burner positioned below said chamber for providing a gas air mixture to said chamber through said aperture in said floor of said chamber, the size of said



aperture restricting the amount of secondary combustion air flowing therethrough in said induced draft toward said slight negative pressure thereby increasing the efficiency of said burner; and

said burner having a plurality of top ports, said burner having a port loading of less than 25,000 Btu per hr-sq in. of port area at the maximum operating Btu rate of said burner.

4,430,542
ELECTROMAGNETIC COOKING APPARATUS

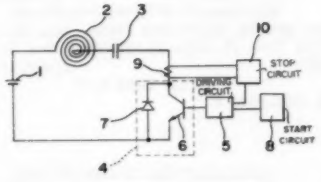
Shigeki Kondo, Tachikawa; Yoshio Yamazaki, Saitama; Tomofumi Iketani, Fuchu; Seiji Tanaka, Yamatokoriyama, and Keiichiro Doi, Izumi, all of Japan, assignors to Riccar Co., Ltd., Tokyo and Sharp Kabushiki Kaisha, Osaka, both of, Japan

Filed Sep. 11, 1981, Ser. No. 301,129

Claims priority, application Japan, Sep. 20, 1980, 55-131121

Int. Cl.[3] **H05B** *6/06;* **H02M** *7/537*

U.S. Cl. 219—10.77 **3 Claims**



1. An electromagnetic cooking apparatus which comprises

a resonance circuit composed of a heating coil and a capacitor,

an inverter circuit including a switching power transistor having a base and a diode connected between a collector and an emitter of said switching transistor in the reverse direction, said resonance circuit and inverter circuit being connected in series across terminals of a DC power source,

a start-signal generating circuit for periodically developing a start pulse signal,

a stop-signal generating circuit which receives value of current flowing through said heating coil as an input signal so as to develop a stop pulse signal when the value of said current becomes zero, and

a driving circuit coupled to said inverter circuit and also to said start-signal generating circuit and said stop-signal generating circuit so as to receive said start pulse signal and said stop pulse signal as inputs and to develop a signal for rendering said switching transistor conductive after developing said start pulse signal until developing of said stop pulse signal,

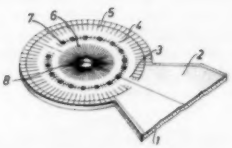
whereby the timing of switching of said transistor is controlled through detection of current flowing through said heating coil and said stop pulse signal is produced when the current value flowing through said heating coil becomes zero.

4,430,543

INDUCTOR FOR INDUCTION WELDING AND A METHOD FOR THE MANUFACTURE OF THE SAME

Bo H. O. Olofsson, Kävlinge, Sweden, assignor to Tetra Pak Developpement SA, Pully-Lausanne, Switzerland

Continuation of Ser. No. 125,752, Feb. 28, 1980, abandoned.
This application Apr. 26, 1982, Ser. No. 371,942
Claims priority, application Sweden, Mar. 8, 1979, 7902078
Int. Cl.³ H05B 6/42
U.S. Cl. 219—10.79 **10 Claims**



1. An inductor for induction welding comprising a base of an electrically insulating material having a surface, an induction coil of an electrically conducting material, said electrically conducting material being a thin, planar copper foil, said foil being laminated to the surface, said induction coil being defined by ends of a plurality of slits extending completely through the copper foil, at least a portion of said plurality of slits extending to an edge of the foil and defining cooling tongues between adjacent slits, said tongues extending in the plane of the foil.

4,430,544

EDM MACHINE TOOL WITH COMPOUNDED ELECTRODE-RECIPROCATION AND SERVO-FEED DRIVERS

Kiyoshi Inoue, Tokyo, Japan, assignor to Inoue-Japax Research Incorporated, Japan

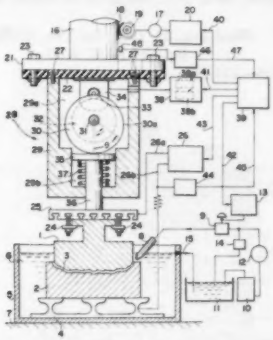
Filed Aug. 3, 1981, Ser. No. 289,147
Claims priority, application Japan, Aug. 5, 1980, 55-106726
Int. Cl.³ B23P 1/08
U.S. Cl. 219—69 V **20 Claims**

1. In an EDM machine tool for machining a workpiece electrode wherein a tool electrode and the workpiece electrode one of which is movable are spacedly juxtaposed with one another to define a machining gap therebetween in the presence of a liquid machining medium and a succession of electrical discharges are effected between the tool electrode and the workpiece electrode across the machining gap to electroerosively remove material from the workpiece electrode, the combination of:

a machine-head spindle for supporting said movable electrode;

first motor means drivingly coupled with said machine-head spindle and responsive to electrical conditions in said machining gap for axially displacing said spindle to move said movable electrode towards and away from the other electrode so as to maintain said machining gap in size substantially constant; and

an electrode reciprocating assembly mechanically coupled between said machine-head spindle and said movable electrode and including a rotary member, second motor means operable independently of said first motor means and drivingly coupled with said rotary member for reciprocatingly angularly displacing said rotary member through only a



limited angle θ of rotation where $0° < \theta \leqq 180°$ and link means coupled between said rotary member and said movable electrode for converting the reciprocatory angular displacement of said rotary member into a corresponding rectilinear reciprocatory movement of said movable electrode; and

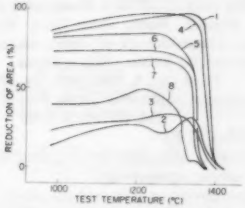
reciprocation stroke setting means associated with said second motor means for determining said limited angle θ of reciprocatory angular displacement of said rotary member so as to set the stroke of rectilinear reciprocatory movement of said movable electrode at a desired value.

4,430,545

METHOD FOR SUBMERGED-ARC WELDING A VERY LOW CARBON STEEL

Naomichi Mori, Yamato; Hiroyuki Homma, Isehara; Masakuni Wakabayashi, Sagamihara, and Masanobu Yamaguchi, Kisarazu, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Sep. 15, 1981, Ser. No. 302,357
Claims priority, application Japan, Sep. 24, 1980, 55-131578
Int. Cl.³ B23K 9/18
U.S. Cl. 219—73 **13 Claims**



1. A method for submerged-arc welding steel, which comprises submerged-arc welding steel containing 0.005–0.06%C using a welding wire containing more than 0.18%, up to 0.55%C, and also using a welding flux, wherein at least one

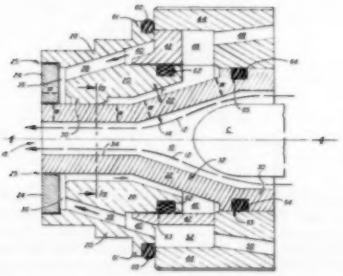
member selected from the group consisting of Ti and B is added to at least one member selected from the group consisting of said welding wire and said welding flux, whereby the resultant weld metal contains 0.07–0.13%C and also contains Ti and B.

4,430,546

PLASMA SPRAY GUN NOZZLE

Gary C. Irons, Sea Cliff; Dennis K. Buzzelli, Old Bethpage; John F. Klein, Port Washington, and Richard T. Smyth, Huntington, all of N.Y., assignors to Metco, Inc., Westbury, N.Y.

Filed Aug. 14, 1981, Ser. No. 292,762
Int. Cl.³ B23K *9/00*
U.S. Cl. 219—121 PY **11 Claims**



1. In a plasma spray gun, a nozzle comprising, in combination:

an inner member made of a fluid impervious material defining a passage for channeling of gases through an electrical arc terminating in an area of the inner surface of said inner member, said inner member having a uniform wall thickness in substantially the entire region of where the arc terminates in the range of about 1.9 to 2.8 mm; and

an outer member at least partially surrounding said inner member and forming a substantially single coolant passage between said outer member and said inner member in the region radially outward of where said electrical arc terminates, said coolant passage having a uniform distance T between said outer member and said inner member in the range of about 0.76 mm. to 1.27 mm. in substantially the entire region radially outward of the area where said arc terminates on said inner member.

4,430,547

CLEANING DEVICE FOR A PLASMA ETCHING SYSTEM

Masahiro Yoneda, Itami; Shiro Hine, Minoh, and Hiroshi Koyama, Amagasaki, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 6, 1981, Ser. No. 309,098
Claims priority, application Japan, Oct. 9, 1980, 55-141480
Int. Cl.³ B23K *9/00*
U.S. Cl. 219—121 PD **6 Claims**

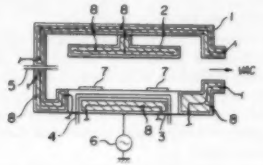
1. A cleaning apparatus for a plasma etching system for etching a sample, comprising:

a chamber having an inlet and an outlet;

a sample table positioned in said chamber and which further comprises a first electrode;

a counter electrode positioned in said chamber opposite said first electrode; and

a plurality of heating mechanisms respectively positioned in said inlet and said outlet of said chamber, in said counter electrode and in said sample table for desorbing a reaction product adsorbed on surfaces of said inlet and outlet of



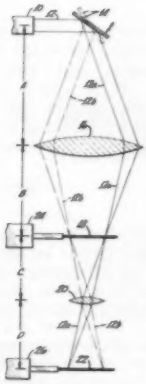
said chamber, said counter electrode and said sample table prior to plasma etching of said sample.

4,430,548

LASER APPARATUS AND PROCESS FOR CUTTING PAPER

John A. Macken, P.O. Box 696, Santa Rosa, Calif. 95402

Filed Apr. 26, 1982, Ser. No. 371,535
Int. Cl.³ B23K *9/00*
U.S. Cl. 219—121 LG **15 Claims**



1. In a laser apparatus, the combination comprising:

laser means for providing a laser beam;

scanning means for directing said laser beam along a predetermined path;

first optical means for intercepting the so-called laser beam and for directing it to a point where the undiffracted rays of the scanned laser beam are superimposed;

template means at or near the plane of the focus of said laser beam, said template means having means therein for passage therethrough of a portion of the so-scanned laser beam for creating an image;

second optical means for intercepting the so-scanned laser beam passing through said template means, said second optical means being positioned at or near the point where all undiffracted rays of the so-scanned laser beam passing therethrough are superimposed; and

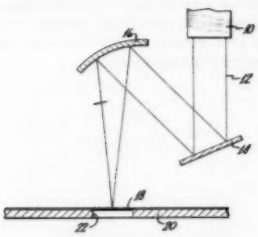
a work-piece positioned at the focal plane of said second optical means for imaging the scanned laser energy passing through said template means, this imaged laser energy being of sufficient power density to vaporize a portion of said workpiece thereby reproducing the image of said template means thereon.

4,430,549

METHOD AND APPARATUS FOR PRODUCING DECKLE-EDGED PAPER

John A. Macken, P.O. Box 696, Santa Rosa, Calif. 95402

Filed Apr. 26, 1982, Ser. No. 371,539
Int. Cl.³ B23K 27/00
U.S. Cl. 219—121 LG 10 Claims



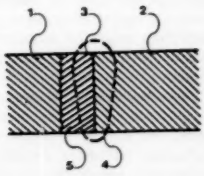
1. In a laser apparatus for cutting paper, the combination comprising:
- means for supporting the paper to be cut;
- a laser source for projecting a laser beam;
- means for providing relative movement between the paper and said laser beam; and
- means for providing a line focus of the laser beam at the surface of the paper having an energy density gradient at the paper surface in a direction generally perpendicular to the direction of relative movement, the energy density gradient having a first zone for completely vaporizing the paper and at lease one other zone for at least partial reduction of thickness of the paper whereby to form an irregular deckle edge on said paper.

4,430,550

ELECTRON BEAM WELDING

Bruno J. M. de Sivry, Paris; Claude R. Carsac, St. Leu La Foret, and Christian Bonnet, St. Gervais, all of France, assignors to Compagnie Francaise des Petroles, Paris, France

Division of Ser. No. 186,078, Sep. 11, 1980, Pat. No. 4,358,656.
This application Jun. 7, 1982, Ser. No. 385,964
Claims priority, application France, Sep. 14, 1979, 79 22948
Int. Cl.³ B23K 15/00
U.S. Cl. 219—121 ED 8 Claims



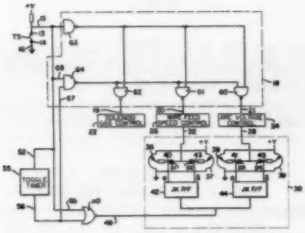
1. An apparatus for welding cylindrical pieces by means of an electron beam welding operation, comprising:
- a leak-tight chamber having a shape of a torus, said chamber having a high vacuum therein, said chamber having a sheath which has an inlet located on an outer wall of said chamber and an outlet located on a radially inner wall of said chamber, said chamber having an inner boundary forming an inner space which accommodates said cylindrical pieces;
- at least one electron gun located in said chamber;
- a wire obtained by arc welding a mild or slightly alloyed steel or by melting under slag a mild or slightly alloyed steel, said wire being made of a material which is different from a material of said cylindrical pieces, said wire material having between 100 and 800 ppm oxygen;
- means for displacing said wire through said sheath; and
- sealing gaskets, said sealing gaskets being connected to said sheath at said inlet and outlet thereof.

4,430,551

SEMI-AUTOMATIC CONTROL AND METHOD FOR MIG WELDING

Tibor E. Toth, Florence, S.C., assignor to Union Carbide Corporation, Danbury, Conn.

Filed Feb. 12, 1982, Ser. No. 348,346
Int. Cl.³ B23K 9/10
U.S. Cl. 219—132 4 Claims



1. In a method of MIG welding in which the energization and deenergization of the welding operation is controlled from a single toggle switch having only a first and second position and in which selected operational parameters of the welding operation such as wire feed speed, arc voltage, and shielding gas are controllably varied between a first preset schedule of welding parameters and a second preset schedule in response to the position of said toggle switch, the improvement comprising:
- detecting the state of the toggle switch;
- initializing the welding operation using the first preset schedule of welding parameters in response to detection of the second position of the toggle switch;
- enabling a timing operation of a predetermined relatively short time duration in response to the detection of the toggle switch in its first position;
- detecting a reoperation of the toggle switch within said predetermined time duration for switching from said first preset schedule to said second preset schedule;
- deenergizing said welding operation upon the concurrence of said relatively short time duration and the absence of a reoperation of the toggle switch;
- repeating said reevaluation of the state of said toggle switch for reenabling said timing operation each time said toggle switch is in the first position and switching between said preset schedules each time said toggle switch is reoperated within the predetermined time duration of said timing operation.

4,430,552

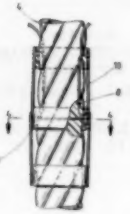
THERMAL RELEASE DEVICE

David D. Peterson, 6434 Old Chesterbrook Rd., McLean, Va. 22101

Filed Jul. 29, 1981, Ser. No. 287,886
Int. Cl.³ H05B 3/02
U.S. Cl. 219—200 9 Claims

1. A remotely actuated device for releasing a buoyant object connected to an anchor on the floor of a body of water which comprises:
- a thermoplastic fiber rope connective link between the buoyant object and the anchor;
- a high resistance wire heating element embedded across a cross-section of said rope;

a thermal barrier to prevent heat loss from said heating element to the surrounding water, said barrier comprising a sealant impregnated zone in said rope above and below said heating element and a sheath encircling said connective link in the area of said heating element, said sheath being readily partable in the vicinity of the heating element upon melting of the link;



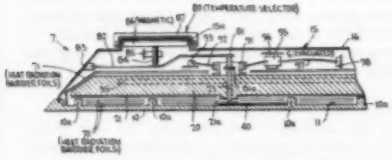
remotely activated means to supply an alternating electric current to said wire to melt said rope.

4,430,553

HEAT ACCUMULATING IRON

Antim Antimovski, u/"Oslo", 91000 Skopje, Yugoslavia

Filed Oct. 9, 1980, Ser. No. 195,592
Claims priority, application Yugoslavia, Oct. 9, 1979, 2447/79
Int. Cl.³ D06F 75/24, 75/26; H05B 1/02; F28F 27/00
U.S. Cl. 219—258 14 Claims



1. A cordless flatiron which includes

a bottom sole plate and a protective hood attached to said sole plate to form an evacuated, sealed chamber therebetween, said sole plate including an exposed bottom surface which defines an ironing surface and a top surface which faces the sealed chamber, the top surface having a number of projections which extend away from the top surface into the chamber, each of the projections having a flat upper end surface,

a heat storage element positioned in the sealed chamber, said heat storage element having a top face and a planar bottom face, said heat storage element being movable toward and away from the upper end surfaces of the projections extending away from the top surface of said sole plate such that its bottom face will be in and out of heat conduction relationship therewith,

an electric heating means positioned in contact with said heat storage element to heat said heat storage element, said electric heating means being electrically connected to an electrical connector means on the hood and which is removably connectable with an external electrical supply means,

a temperature-responsive regulator element positioned between said heat storage means and the top surface of said sole plate, the regulator element being capable of moving said heat storage element with respect to the upper end surfaces of the projections extending away from the top surface of said sole plate and thus control the temperature to which said sole plate is heated by said heat storage element, said regulator element being responsive to the temperature of said sole plate, and

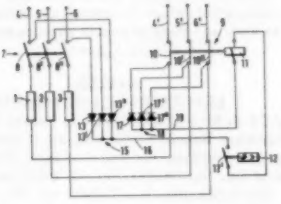
a heat radiation barrier means positioned between said heat storage element and said sole plate, said heat radiation barrier means being shaped such that it shields the entire sole plate, including its projections, from heat radiation from the heat storage element when the heat storage element is moved away from its closest position with respect to said sole plate by the temperature-responsive element yet forms a direct heat conductive path between the bottom of the heat storage element and the upper end surfaces of the projections of said sole plate, while shielding the areas of the sole plate between said projections, when the heat storage element is at its closest position with respect to said sole plate.

4,430,554

ELECTRICAL SAFETY DEVICE FOR HEATERS WITH A HIGH CURRENT CONSUMPTION

Karl-Heinz Fleischmann, Saal, Fed. Rep. of Germany, assignor to Forbach GmbH & Co. KG, Bad Neustadt, Fed. Rep. of Germany

Filed Dec. 23, 1981, Ser. No. 333,689
Claims priority, application Fed. Rep. of Germany, Dec. 23, 1980, 3048643
Int. Cl.³ H05B 1/02
U.S. Cl. 219—483 5 Claims



1. A safety device for an electrical heater having at least one heating element which operates with high current consumption, comprising: two power leads for connection to a power supply;

thermostatic switching means for monitoring the temperature within the heater and having a temperature-actuated movable contact;

circuit breaker means including at least one normally closed movable contact arranged for connection, in series with a heating element, between the power leads, and a power responsive actuating coil for opening said normally closed contact in response to supply of electrical power to said coil, one side of said coil being connected to one side of said thermostatic switchng means movable contact;

at least one first diode connected in series between one power lead and the other side of said thermostatic switching means movable contact; and

at least one second diode connected in series between the other side of said coil and the other power lead and poled, with respect to the voltage across the power leads, in the same direction as said first diode;

whereby closing of said thermostatic switching means movable contact will cause power from the power supply to be supplied to said coil for opening said normally closed movable contact and disconnecting the heating element from the power supply.

4,430,555

ELECTRODE STEAM BOILER AND METHOD OF OPERATION THEREOF

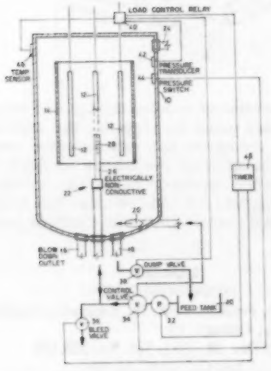
Ian D. Stokes, Krugersdorp-North, South Africa, assignor to Marshall-Fowler Limited, South Africa

Filed Sep. 15, 1980, Ser. No. 187,061

Claims priority, application South Africa, Sep. 17, 1979, 79/4905; Mar. 25, 1980, 80/1733

Int. Cl.³ F22B *1/30*; H05B *1/02, 3/60*

U.S. Cl. 219—286 12 Claims



1. A method of operating an electrode boiler having a boiler shell and spaced electrodes disposed in an electrode zone located above a relatively cold water zone in the boiler shell including the steps of energizing the electrodes, continuously sensing steam pressure in the boiler, establishing a pre-set boiler steam pressure, introducing water into the boiler while the boiler is below or substantially at the pre-set steam pressure, directly into the electrode zone of the boiler, and, when the steam pressure in the boiler is above the pre-set pressure, introducing the water only into the relatively cold water zone below the electrode zone.

4,430,556

ELECTRIC LIQUID HEATING APPLIANCE

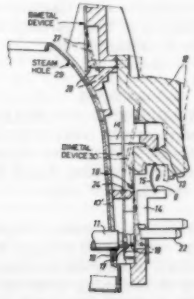
Michael Inskip, Stoke-on-Trent, and Alan Warren, Western Downs, both of England, assignors to TI Russell Hobbs Limited, England

Filed Jun. 16, 1981, Ser. No. 274,265

Claims priority, application United Kingdom, Jun. 18, 1980, 8019848

Int. Cl.³ F24H *1/00*; H05B *3/02*

U.S. Cl. 219—328 5 Claims



1. An electric liquid heating appliance comprising a body shell, a heating element within the body shell and having two ends which project through the body shell to the outside thereof, a switch housing mounted on the outside of the body shell, a switch comprising a pair of switching contacts and a switch operating member which is supported by the switch housing and which is manually operable both to close and open the switching contacts, said switch having a resilient blade-like electrically conductive element movable by said switch operating member, one of the switching contacts comprising a fixed contact provided directly on one end of the heating element and the other switching contact comprising a movable contact provided on the blade-like electrically conductive element, and means supported by the switch housing and mounted to sense steam from within the body shell for moving the switch operating member to move said blade-like element and open the contacts when a liquid in the appliance boils.

4,430,557

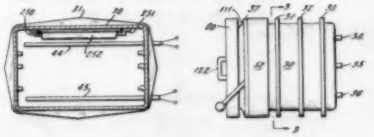
COOKING APPARATUS HAVING INTERNAL PRESSURIZING SOURCE AND INTEGRAL HEAT SOURCE

Charles W. Eichelberger, Schenectady, and Robert J. Wojnarowski, Ballston Lake, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jan. 4, 1982, Ser. No. 336,805

Int. Cl.³ F27D *11/02*; A21B *1/00*

U.S. Cl. 219—401 31 Claims



1. An interior oven structure, comprising:

a hermetically-sealable metal container having a metal door which is operable to offer access to the interior of said container and closeable to seal the interior of said container;

means for supporting within said container foodstuff to be cooked;

heating means within said container and energizable to produce infrared heat for browning said foodstuff while said container is pressurized; and

means totally contained within said container, and separated from but cooperating with said heating means in said container, for producing steam, to pressurize the interior of said container when said door seals the interior of said container.

4,430,558

ELECTRIC RADIANT HEATER UNIT FOR A GLASS CERAMIC TOP COOKER

Joseph A. McWilliams, Hadzor, England, assignor to Micropore International Ltd., Hadzor Droitwich, England

Filed Jul. 21, 1981, Ser. No. 285,484

Claims priority, application United Kingdom, Jul. 22, 1980, 8023929

Int. Cl.³ H05B *3/68*

U.S. Cl. 219—449 15 Claims

1. An electric radiant heater unit of the type comprising:

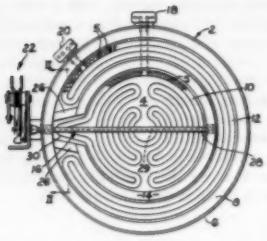
a support of thermal insulating material, the support having a peripheral wall;

at least first and second heater elements arranged adjacent to one another on the support;

a dividing wall of thermal insulating material separating said first and second heater elements;

means for energising said first heater element independently of said second heater element; and

a thermal cut-out device which extends from said peripheral wall across said first heater element and across a zone normally occupied by at least a part of said second heater element,



wherein the improvement comprises extending a zone of the heater unit which is heated by said first heater element such that substantially the entire effective length of the cut-out device is influenced by said first heater element.

4,430,559

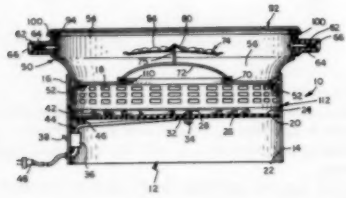
ELECTRIC GRILL

Michel N. R. Rabay, Avenida Cuauhtemoc No. 891-502, Colonia Narvaret, Mexico 12, D. F.

Filed May 24, 1983, Ser. No. 497,668

Int. Cl.³ H05B *3/68*

U.S. Cl. 219—460 **11 Claims**



1. An electric cooking grill comprising: a base including side walls defining an open space interiorly thereof and including an upper portion and a lower portion, a convoluted electric resistance element mounted in a lower portion of said base, a plurality of rows of ventilation openings in the side wall of the upper portion of said base, a plurality of interior support brackets on said side walls, a crown-like tray having a central opening therein and supported on said brackets above said resistance element, a bridge support supported on said tray, a rotatable, perforated disc element rotatably supported on said bridge support for rotation in a generally horizontal plane, and a circular grill element supported on said tray above said disc.

4,430,560

ELECTRICAL HEATING APPARATUS OVERHEAT PROTECTION CIRCUITS

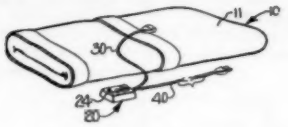
Edwin R. Mills, Raleigh, and Ernest L. Elmore, Smithfield, both of N.C., assignors to Fieldcrest Mills, Inc., Eden, N.C.

Continuation-in-part of Ser. No. 184,200, Sep. 5, 1980, abandoned. This application Dec. 10, 1981, Ser. No. 329,391

Int. Cl.³ H05B *1/02*

U.S. Cl. 219—505 **8 Claims**

1. An electrical heating apparatus protected against an overheating condition and comprising electrical heating means for generating heat upon flow of electrical current therethrough, overheat protection means including temperature sensitive impedance means having a negative temperature coefficient and being thermally coupled to said electrical heating means for sensing the occurrence of an overheating condition therein, a pair of gate controlled bidirectional semiconductor switches electrically connected to one another in series, means electrically connecting said pair of semiconductor switches to said heating means for controlling the flow of electrical current thereto, and means electrically coupling the gate of each one of said semiconductor switches to another terminal of the same



one of said semiconductor switches through said temperature sensitive impedance means for triggering the semiconductor switches from a conductive to a nonconductive state in response to the sensing of an overheating condition by said temperature sensitive impedance means, said semiconductor switches being triggered to a nonconductive state by a change in resistivity of said temperature sensitive impedance means.

4,430,561

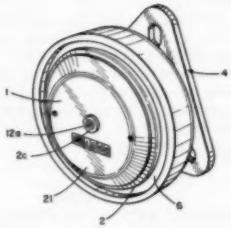
HUBODOMETER

Patrick L. Powell, Franklin Park, Ill., assignor to Standard Car Truck Company, Chicago, Ill.

Filed Dec. 28, 1981, Ser. No. 335,159

Int. Cl.³ G01C *22/00*

U.S. Cl. 235—95 B **17 Claims**



1. In a hubodometer having an odometer mechanism assembly contained within an enclosed casing supported by a mounting bracket adapted to be fixed to a rotating object, the improvement comprising a casing formed by two joined cup-like shells each having a circular flange integrally formed at a mouth of the shell and lying against the flange of the other shell to define an enclosed cavity, an elastic-like gasket seated upon the joined flanges, and a rigid retainer ring seated upon the gasket and fitted tightly to a circular wall of the mounting bracket to nest the casing at least partially within a socket cavity defined by the mounting bracket.

4,430,562

BANKNOTE DISPENSING APPARATUS

Leif Lundblad, Häradsvägen 102, S-141 41 Huddinge, Sweden

Filed May 24, 1982, Ser. No. 381,656

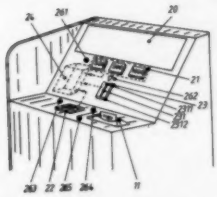
Claims priority, application Sweden, Jun. 4, 1981, 8103515

Int. Cl.³ G06F *15/30*

U.S. Cl. 235—379 **2 Claims**

1. An apparatus for dispensing banknotes from a store (10) of banknotes to a receipt opening (10) arranged in the apparatus and accessible to a client, said apparatus comprising first conveying means (13–14) for conveying banknotes from the store (10) to a collecting chamber (15) and second conveying means (16–17) for conveying the collected banknotes from the col-

lecting chamber (15) to the receipt opening (11), characterized by a first keyboard (21) for disclosing the number of banknotes required or the sum required; a card reader (23) located adjacent the first keyboard (21); a second keyboard (22) arranged adjacent the card reader (23) at a location substantially further from the first keyboard (21) than the card reader (23), and on which the individual code of the customer is to be inserted; and an electronic unit (24) for controlling the outfeed of banknotes



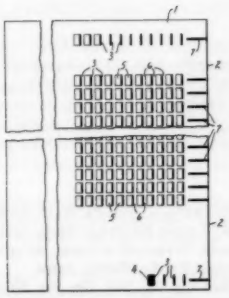
from the store (10) to the receipt opening (11) in response to activation of the two keyboards (21,22) and activation of the card reader (23) by the customer, the electronic unit (24) being so designed that it is necessary for the customer to have activated the first keyboard (21) and the card reader (23) in order for the first conveying means (13–14) to be activated, and that it is necessary for the second keyboard (22) to have been activated in order for the second conveying means (16–17) to be activated.

4,430,563

DATA PROCESSING FORM

John A. Harrington, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 30, 1982, Ser. No. 373,666
Int. Cl.³ G06K *19/06*
U.S. Cl. 235—494 **7 Claims**



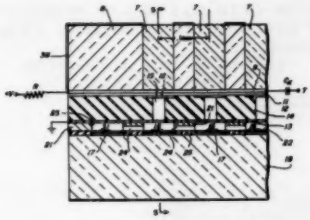
1. A data processing form provided by a generally rectangular sheet of paper or like material having longitudinal and transverse axes, and at least one generally straight edge parallel with one of said axes for use with an apparatus capable for providing a plurality of scanning actions as the sheet is moved in the general direction of said straight edge, each of said scanning actions beginning near said straight edge and continuing in a direction generally transverse to said straight edge, said scanning actions serving to sense light and dark areas on the sheet, said form including: a plurality of like, generally rectangular darkened areas that extend lengthwise and generally parallel to said straight edge; a plurality of rows defined by said rectangular darkened areas, equally spaced apart in said rows; each of said rows extending transverse to said straight edge with the space presented between adjacent ones of said rectangular darkened areas in any given row being greater than the width of one of said rectangular darkened areas; said rectangular darkened areas in a given row being aligned columnwise with said rectangular dark areas presented in the remaining rows of said plurality of rows; the first of said plurality of rows to be scanned by an apparatus, having at least one darkened area formed in part by one of said rectangular darkened areas and extending from the side of such rectangular darkened area that is away from said straight edge; another row of said plurality of rows having at least two defined areas wherein each of the defined areas is defined in part by a different one of said rectangular darkened areas of such row and is located on the side of such rectangular darkened area that is away from said straight edge and an edge mark for each of said plurality of rows, said edge mark for each row positioned between the first rectangular darkened area of the row and said straight edge.

4,430,564

IMAGE CONVERSION APPARATUS WITH GAS DISCHARGE SWITCHING

Dieter Fischer, Frankfurt, Fed. Rep. of Germany, assignor to Triumph-Adler A.G. für Büround Informationstechnik, Nuremburg, Fed. Rep. of Germany

Filed Jun. 8, 1981, Ser. No. 271,620
Int. Cl.³ H01J *40/14*
U.S. Cl. 250—211 R **9 Claims**



1. An image converter for generating a signal proportional to light incident thereon comprising

a first light responsive capacitor,

a second capacitor connected in series with said first capacitor across a voltage source whereby the charge distribution in said capacitors is proportional to light incident on said first capacitor,

means for shorting out said second capacitor whereby said first capacitor charges to the voltage of said source, and

means for measuring the change in voltage across said first capacitor.

4,430,565

CORRELATING FIBER OPTICAL MEASURING DEVICE

Torgny Brogardh, and Lars Sander, both of Västerås, Sweden, assignors to ASEA Aktiebolag, Västerås, Sweden

Filed Sep. 23, 1981, Ser. No. 304,955
Claims priority, application Sweden, Sep. 24, 1980, 8006679
Int. Cl.³ G01J *3/34*; G01D *5/34*
U.S. Cl. 250—227 **17 Claims**

1. A fiber optical measuring device for measuring, at a measurement point, at least one parameter of an object comprising:

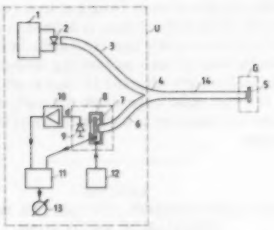
a transducer unit at the measuring point having at least one optical transducer filter with a response spectrum subjected to wavelength displacement by said at least one parameter to be measured,

an evaluating unit separated from the transducer unit, said evaluating unit including at least one source of incident light and an optical detector arrangement for analyzing light emanating from the transducer unit, and

at least one light conductor for feeding incident light to the transducer unit and for feeding light emanating from said at least one optical transducer filter to the evaluating unit,

wherein the detector arrangement includes at least one opti-

cal detector filter, means to subject the response spectrum thereof to wavelength displacement by the light emanating from said at least one optical transducer filter and means to measure the correlation between the spectra of a



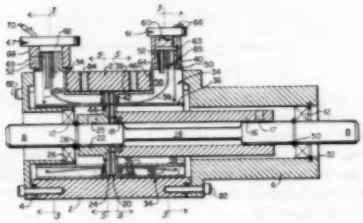
transducer filter and a corresponding detector filter to determine the spectral condition of the said transducer filter and thus determine the magnitude of the at least one parameter being measured.

4,430,566

ELECTRO-OPTICAL ANGULAR DISPLACEMENT

Robert F. Searle, Amherst, N.H., assignor to Vibrac Corporation, Amherst, N.H.

Filed Apr. 21, 1981, Ser. No. 256,080
Int. Cl.³ G01D 5/34
U.S. Cl. 250—231 SE 9 Claims



1. In a device for providing an electrical signal having a magnitude which varies in accordance with the angular displacement about an axis between a pair of disks substantially coaxially and radially mounted about said axis, each disk providing a series of alternately occurring relatively high light transmitting areas and relatively low light transmitting areas arranged in an array about said axis, illuminating means on one side of said disks for illuminating said disks, and detector means including a photosensitive light detector for providing an electrical signal that varies in response to the amount of light passing through both of said disks,

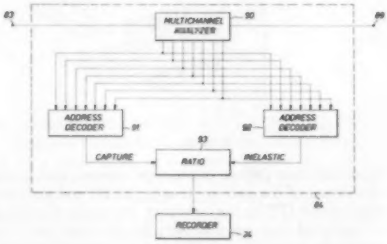
the improvement comprising first and second optical means included respectively in said illuminating means and said detector means, said first and second optical means each being provided with means defining a first annular aperture and a second aperture, said first optical means being disposed between a light source and said disks and said second optical means being disposed between said disks and said light detector, the annular apertures of said optical means having substantially equal respective inner and outer diameters and facing one another through said disks, said annular apertures being disposed substantially coaxially with said axis and said second apertures being disposed away from said axis, and the second apertures of said optical means facing respectively said light source and said light detector.

4,430,567

METHOD AND APPARATUS FOR NEUTRON INDUCED GAMMA RAY LOGGING FOR DIRECT POROSITY IDENTIFICATION

Donald W. Oliver, and David M. Chace, both of Houston, Tex., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Jan. 22, 1981, Ser. No. 227,331
Int. Cl.³ G01V 5/10
U.S. Cl. 250—270 11 Claims



6. A method of determining the porosity of subsurface formations, comprising the steps of:

irradiating said formations with neutrons of an energy level sufficient to induce inelastic scattering and capture gamma ray production;

detecting capture gamma rays and inelastic scattered gamma rays emanating from said irradiated formations;

generating first electrical signals responsive to said detected capture gamma radiation having energies consisting of substantially the total energy spectrum of detected capture gamma radiation;

generating second electrical signals responsive to said detected inelastically scattered gamma radiation having energies consisting of substantially the total energy spectrum of detected inelastically scattered gamma radiation; and

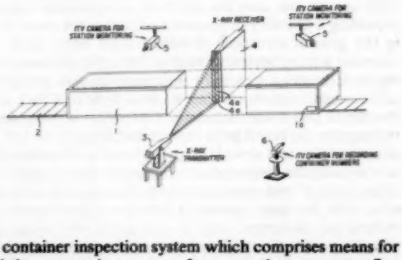
combining said first and second electrical signals to form a ratio functionally related to substantially the total energy spectrum of detected capture gamma radiation to substantially the total energy spectrum of detected inelastically scattered gamma radiation to provide a third electrical signal representative of said formation porosity.

4,430,568

CONTAINER INSPECTION SYSTEM

Osami Yoshida, Tokyo; Hidekazu Tsuji, Amagasaki, and Yoshitada Nomura, Tokyo, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 21, 1981, Ser. No. 303,989
Claims priority, application Japan, Sep. 22, 1980, 55-131854
Int. Cl.³ G01N 23/00
U.S. Cl. 250—358.1 3 Claims



1. A container inspection system which comprises means for transmitting a container; means for generating an energy flux

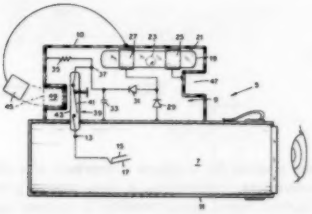
which is transmitted inside of said container; at least one sensor for detecting an energy level and spatial location of energy flux transmitted through the inside of said container; and a processing unit for performing a predetermined image processing based on an output signal received from said at least one sensor whereby a signal for variable density of image data for a transmission factor of said container is processed by said processing unit to inspect said container without disturbing said container, said processing unit comprising means for storing an index defining a size and a respective predetermined energy flux level, means for comparing said index with the detected energy level and spatial location of said energy flux detected by said at least one sensor; and display means for automatically indicating when said comparing means determines that the energy level and spatial location of the energy flux detected by said at least one sensor matches the stored index.

4,430,569

POCKET RADIATION DOSIMETER--DOSIMETER CHARGER ASSEMBLY

Frank W. Manning, Norris, Tenn., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Mar. 17, 1982, Ser. No. 358,960
Int. Cl.³ G01T 1/18
U.S. Cl. 250—377 **11 Claims**



1. An electrometric system comprising:
(a) an electrometric radiation dosimeter having a pair of charging contacts, and
(b) a dosimeter-charging circuit, said circuit including:
(1) an electrostatic charge generator including a wall of dielectric material, a mobile and electrically conductive body in contact with a face of said wall, and means confining said body for movement along said face while in contact therewith for generating electrical charges on said wall,
(2) a cascade voltage-doubler circuit capacitively coupled to said generator to integrate generator voltage pulses of like polarity and thus provide an integrated-voltage output, and
(3) switch means for selectively impressing said output across said contacts of said dosimeter.

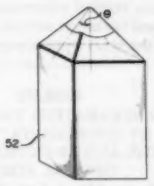
4,430,570

ELECTRON BEAM EXPOSING APPARATUS

Tadahiro Takigawa, Tokyo, and Isao Sasaki, Chiba, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Dec. 4, 1980, Ser. No. 213,026
Claims priority, application Japan, Dec. 5, 1979, 54-156915
Int. Cl.³ H01J 1/16
U.S. Cl. 250—423 R **6 Claims**

1. An electron beam exposing apparatus comprising:
an electron gun having a cathode which is made of a single-crystal lanthanum hexaboride and which is shaped into a cone with half the vertical angle being between 60° and 85° such that the spread of the electron beam is kept below a predetermined value, that the luminous intensity of the electron beam is increased while still keeping said spread below said predetermined value and that the current density in a variably shaped aperture is kept uniform;
means for heating said cathode at a given temperature to irradiate an electron beam of which a crossover image and an emission pattern are circular;



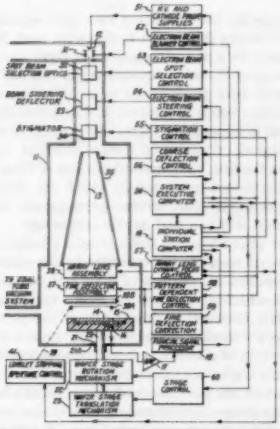
means, including openings of variable shape, for shaping the electron beam irradiated from said cathode into the shapes of the openings; and
means for focusing the shaped beam to form a beam spot having an area of 2 to 50 μm^2 on a sample.

4,430,571

METHOD AND APPARATUS FOR EXPOSING MULTI-LEVEL REGISTERED PATTERNS INTERCHANGEABLY BETWEEN STATIONS OF A MULTI-STATION ELECTRON-BEAM ARRAY LITHOGRAPHY (EBAL) SYSTEM

Donald O. Smith, Lexington, and Kenneth J. Harte, Carlisle, both of Mass., assignors to Control Data Corporation, Minneapolis, Minn.

Filed Apr. 16, 1981, Ser. No. 254,870
Int. Cl.³ H01J 37/147
U.S. Cl. 250—492.2 **35 Claims**



1. The method of operating an electron beam array lithography system employing an electron beam column of the array optics type having an array lenslet assembly, an array fine deflector assembly and a coarse deflector assembly for selectively directing an electron beam to a desired element of the array of lenslets and its associated fine deflector element which directs the electron beam to a desired point on a target surface; the method comprising fabricating a lenslet stitching calibration grid having formed thereon a grid-like network of fiducial marking elements, using said calibration grid to derive fiducial marking signals indicative of the boundaries of the field of view of the individual elements of array lenslet assembly, using

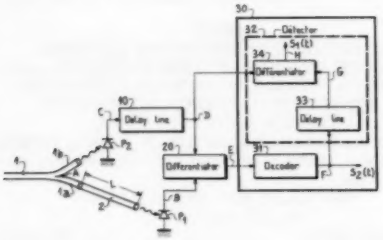
said fiducial marking signals to control the electron beam column so as to stitch together the individual fields of view of the elements in the array lenslet assembly in order to cover a desired area of a target workpiece to be exposed to the electron beam and which is greater in surface area than the area covered by the field of view of an individual array lenslet element, and correcting for height displacement differences due to difference between vertical placement of the lenslet stitching calibration grid and the target surface along the electron beam path axis within the array optic electron beam column.

4,430,572

DEVICE FOR SEPARATING TWO LIGHT SIGNALS EMITTED BY SOURCES HAVING DIFFERENT WAVELENGTHS AND TRANSMITTED IN A SINGLE OPTICAL FIBER

Michel Eve, and Bernard Floch, both of Conflans Ste. Honorine, France, assignors to Lignes Telegraphiques Et Telephoniques, Conflans Ste. Honorine, France

Filed Sep. 14, 1981, Ser. No. 302,031
Claims priority, application France, Sep. 12, 1980, 8019743
Int. Cl.³ G02B 27/00
U.S. Cl. 250—551 8 Claims



1. A device for separating two light signals emitted by two sources having different wavelengths, each light source being modulated by a periodic signal, said light signals having different wavelengths being transmitted in one and the same optical fiber with first propagation times of different value and the optical fiber being terminated in a first branched-off portion of fiber and in a second branched-off portion of fiber, a part of the light signals transmitted being shunted to each portion, wherein the first branched-off portion of fiber is provided with a predetermined extension in which the shunted light signals are transmitted with second propagation times of different value, and wherein said device comprises:

a first photodetector and a second photodetector which are placed respectively opposite to the extension of the first branched-off portion of fiber and opposite to the second branched-off portion of fiber, said first photodetector being intended to detect part of the periodic modulation signals having respective time-delays corresponding to the sum of said first and second propagation times and said second photodetector being intended to detect the other part of the periodic modulation signals having respective time delays corresponding to said first propagation times;

first delay means connected to said second photodetector and adapted to introduce a time delay equal to one of the second propagation times;

first means for differentiation between the delayed periodic signals generated by said first delay means and the delayed periodic signals detected by said first photodetector, said differentiating means being intended to deliver a delayed periodic signal corresponding to a coding of one of the periodic signals which modulates one of the two light sources having different wavelengths;

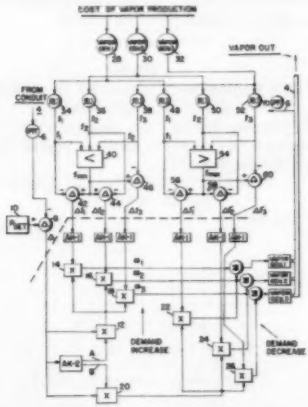
an electronic circuit for processing the delayed periodic signals and comprising means for detecting the other periodic signal which modulates the other light source, said detection means being connected between the output and one of the inputs of the first differentiating means.

4,430,573

LOAD CONTROL FOR ENERGY CONVERTERS

Azmi Kaya, Akron, and Marion A. Keyes, Chagrin Falls, both of Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed Dec. 15, 1981, Ser. No. 330,994
Int. Cl.³ G05B 15/00
U.S. Cl. 290—40 R 3 Claims



1. A load control for a system comprised of a plurality of energy converters, comprising, a first means generating a System Control Signal corresponding to system load, means generating signals corresponding to the cost of production of each of said plurality of converters, means selecting the least cost signal from among said last named signals, means generating output signals during an increase in the System Control Signal and means under the control of the System Control Signal and said output signals permitting said System Control Signal to increase the rate of production of the converter having lowest cost of production while inhibiting a change in the ratio of production of the other converters in said plurality of converters to thereby maintain equilibrium between the total rate of energy conversion by said plurality of converters and demand.

4,430,574

METHOD FOR SWITCHING OPERATION OF WATER WHEEL OR PUMP WATER WHEEL

Kenzu Ogiwara, Hitachi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 31, 1981, Ser. No. 298,262
Claims priority, application Japan, Sep. 1, 1980, 55-119770
Int. Cl.³ F03B 3/10
U.S. Cl. 290—52 4 Claims

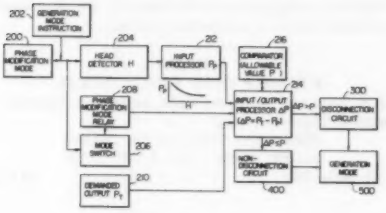
1. A method for switching an operation of a water wheel or a pump water wheel that is coupled to a motor-generator connected to a power system from its spinning-in-air mode into its power generating mode with supplying compressed air into a water wheel chamber to force down the level of water charged in the chamber below the water wheel runner, said method comprising the steps of:

monitoring the head of the water wheel or the pump water wheel and producing an output representing the monitored head;

comparing the output with a predetermined reference; and

switching to the generation mode without disconnecting

said motor-generator from said power system when the monitored head is such that an input amount is below an allowable value of said power system, and switching to



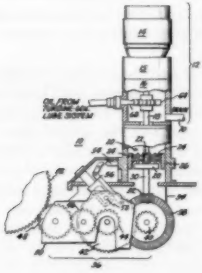
the generation mode with said motor-generator disconnected from said power system when the head is such that the input amount exceeds the allowable value.

4,430,575

TURBINE TURNING GEAR WITH HYDRAULIC OVERSPEED DRIVE

Allen B. Quigg, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Mar. 30, 1982, Ser. No. 363,537
Int. Cl.³ F16H *35/00, 57/00*
U.S. Cl. 290—52 **16 Claims**



1. Apparatus for smoothly starting and slowly rotating the rotor of a turbomachine, comprising:

a drive gear affixed to the turbomachine rotor;

a gearing system fixedly mounted with respect to said turbomachine rotor for transmitting torque to said drive gear to cause rotation of said rotor, said gearing system having an output gearing portion selectively engagable with said drive gear: and

a prime mover system intercoupled to said gearing system to provide said torque thereto, said prime mover system providing torque at a higher initial value for starting rotation of said rotor and for maintaining rotation thereof over a lower speed range and providing torque at a lower, substantially constant value for maintaining rotation of said rotor over a higher speed range contiguous to said lower speed range.

4,430,576

REMOTE LOAD SELECTOR CIRCUIT AND METHOD

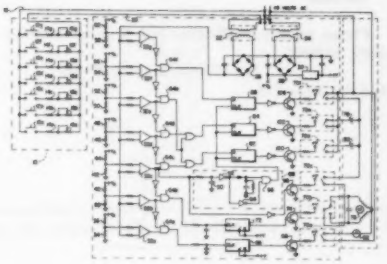
Rick Fowler, 4306 Shilling Way, Dallas, Tex. 75237

Filed Nov. 5, 1981, Ser. No. 318,393
Int. Cl.³ H02U *3/00*
U.S. Cl. 307—38 **11 Claims**

1. Apparatus for remotely controlling a plurality of functions comprising:

first means for providing a plurality of discrete momentary voltage levels;

a plurality of sensing means coupled to and remotely located from said first means, each of said plurality of sensing



means for detecting a particular momentary voltage level; and

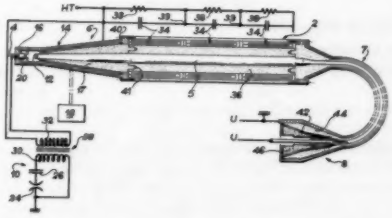
control means coupled to each of said plurality of sensing means for controlling a function in response to the detection of said particular momentary voltage level.

4,430,577

HIGH VOLTAGE ELECTROMAGNETIC PULSE GENERATOR

Gerard Bouquet, Pessac, France, assignor to Commissariat a l'Energie Atomique, France

Filed Feb. 2, 1983, Ser. No. 463,134
Claims priority, application France, Feb. 4, 1982, 82 01812
Int. Cl.³ H03K *3/00*
U.S. Cl. 307—108 **7 Claims**

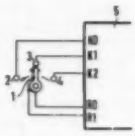


1. A high voltage electromagnetic pulse generator, wherein, it comprises a capacitor having an axis of revolution, disposed around an internal conductor having an axis of revolution coinciding with that of the capacitor, whereby the latter can be charged by a direct current power supply, said direct current power supply having a high voltage terminal and an earth, a conical spark gap, whose axis of revolution can coincide with that of the capacitor having at least two electrodes, namely an external electrode and an internal electrode, and making it possible to discharge the capacitor in pulse-like manner, a ballast resistor having an axis of revolution, connected in series with the spark gap in such a way that the external electrode of the spark gap is directly connected to the high voltage terminal of the power supply and the internal electrode of the spark gap is connected to the earth of said power supply, via the internal conductor and the ballast resistor, as well as spark gap control means, the capacitor, the spark gap and the ballast resistor of said generator forming with the internal conductor a coaxial line having a constant impedance along said line.

4,430,578
DEVICE FOR THE INPUT OF ADJUSTMENT VALUES IN ELECTRONIC SWITCHING SYSTEMS

Helmut Waigand, St. Georgen, Fed. Rep. of Germany, assignor to Bosch-Siemens Hausgeräte GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 14, 1981, Ser. No. 311,432
Claims priority, application Fed. Rep. of Germany, Oct. 17, 1980, 3039302
Int. Cl.³ H01H *1/24, 47/00*
U.S. Cl. 307—115 **5 Claims**

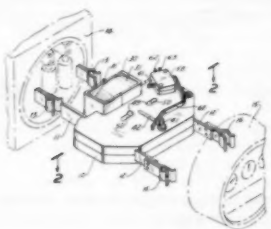


1. Multistage switching device for the input of adjustment values in electronic switching systems, comprising a counter circuit having counting stage inputs for counting orders of magnitude and oppositely counting directional inputs, an input switching part being movable into a plurality of adjustment positions, a plurality of contact points each being disposed at one of said adjustment positions and being connected to one of said counting stage inputs, and a changeover contact device of said input switching part being connected to said oppositely counting directional inputs, the counting magnitude and the counting direction of said counter circuit being switched to predetermined settings by moving said input switching part in any direction and at any speed into said adjustment positions.

4,430,579
ELECTRICALLY OPERATED, MECHANICALLY HELD ELECTRICAL SWITCHING DEVICE

Dominik M. Wiktor, Cranford, N.J., assignor to Automatic Switch Company, Florham Park, N.J.

Filed Aug. 23, 1982, Ser. No. 410,804
Int. Cl.³ H01H *15/00*
U.S. Cl. 307—134 **32 Claims**

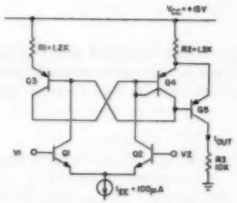


1. An electrical switching device comprising:
(a) switch means having an open position and a closed position,
(b) actuator means reciprocable between two extreme positions, the switch means being open when the actuator means is in one of its extreme positions and the switch means being closed when the actuator means is in the other of its extreme positions,
(c) an electrical operator for controlling movement of the actuator means, the operator being a single electrical solenoid and a single armature movable within the solenoid,
(d) means for momentarily energizing the operator to move the actuator means from each of its extreme positions to the other, each successive momentary energization of the operator causing movement of the actuator means in a direction opposite to that of its immediately preceding movement, and
(e) means for mechanically holding the actuator means in each of its extreme positions after termination of the momentary energization of the operator which caused the actuator means to reach that position.

4,430,580
BISTABLE SWITCHING CIRCUIT

Ralph E. Lovelace, Los Gatos, Calif., assignor to Signetics Corporation, Sunnyvale, Calif.

Filed Sep. 4, 1981, Ser. No. 299,275
Int. Cl.³ H03K *3/023, 3/288, 3/295*
U.S. Cl. 307—288 **25 Claims**



1. A bistable switching circuit comprising:
a substantially constant current source;
like-polarity first and second input transistor means, each having an input control electrode for receiving an input signal, a first flow electrode, and a second flow electrode, the first flow electrodes being coupled in common to the current source;
like-polarity first and second load transistor means complementary to the input means, each load means having a first flow electrode, the first load means having a second flow electrode coupled to the second flow electrode of the second input means and having a control electrode coupled to the second flow electrode of the first input means, and the second load means having a second flow electrode coupled to the second flow electrode of the first input means and having a control electrode coupled to the second flow electrode of the second input means;
an output transistor complementary to the input means, the output transistor having a control electrode coupled to the second flow electrode of the first input means, a first flow electrode, and a second flow electrode from which an output signal is available; and
first and second resistive elements, the first resistive element being coupled between a voltage supply and the first flow electrode of the first load means, one end of the second resistive element being coupled to the voltage supply, and the other end of the second resistive element being coupled in common to the first flow electrodes of the output transistor and the second load means.

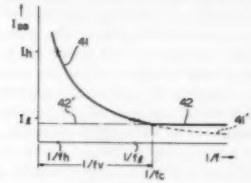
4,430,581
SEMICONDUCTOR SUBSTRATE BIAS CIRCUIT

Jun-ichi Mogi, Kawasaki; Kiyoshi Miyasaka; Seiji Enomoto, both of Yokohama, and Shigeki Nozaki, Kawasaki, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Continuation-in-part of Ser. No. 197,774, filed as PCT/JP79/00274, Oct. 29, 1979, published as WO80/01021, May 15, 1980, § 102(e), Jun. 25, 1980, abandoned. This application May 13, 1981, Ser. No. 263,279
Claims priority, application Japan, Oct. 30, 1978, 53-133384
Int. Cl.³ H03K *3/01, 3/353*
U.S. Cl. 307—296 R **15 Claims**

1. A semiconductor circuit having a dynamic-type circuit and a bias-voltage generating circuit both mounted on the same substrate, wherein the bias-voltage generating circuit com-

prises: first means for absorbing from the substrate a first part of a substrate current, the magnitude of said first part of the substrate current being proportional to the operating frequency of the dynamic-type circuit; and second means, functioning simultaneously with said first means, for absorbing from the substrate a second part of the substrate current, said second part of the substrate current corresponding to the junction leak current developed in the substrate.



4,430,582

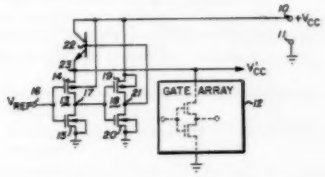
FAST CMOS BUFFER FOR TTL INPUT LEVELS

Bidyut K. Bose, Fremont, and John M. Jorgensen, San Jose, both of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed Nov. 16, 1981, Ser. No. 321,839

Int. Cl.³ H03K *17/30, 17/14*

U.S. Cl. 307—297 **9 Claims**



1. In a CMOS integrated circuit in which at least one gate is designed to switch at a predetermined output reference level and operate with a plurality of other gates from a common power supply, the improvement comprising operating said gates from a regulated supply potential that is derived from said common power supply and is varied to compensate for changes in operating temperature and fabrication parameters, said regulated potential being determined by a representative operating gate that has its input terminal coupled to a TTL compatible reference potential.

4,430,583

APPARATUS FOR INCREASING THE SPEED OF A CIRCUIT HAVING A STRING OF IGFETS

Masakazu Shoji, Warren, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 30, 1981, Ser. No. 316,560

Int. Cl.³ H03K *19/017, 19/094, 19/09*

U.S. Cl. 307—448 **6 Claims**

1. An IGFET circuit comprising:

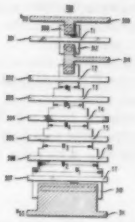
a first terminal for receiving a first operating voltage;

a second terminal for receiving a second operating voltage;

an output terminal for providing an output signal;

load means coupled between the second terminal and the output terminal;

a series string of transistors each having a gate electrode and a conduction channel of a specified width, the string including at least three transistors responsive to input signals at their gate electrodes and coupled between the output terminal and the first terminal and having a positive gradient in conduction channel width in the direction from the output terminal to the first terminal.



4,430,584

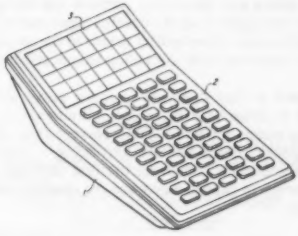
MODULAR INPUT/OUTPUT SYSTEM

Ashok H. Someshwar, Austin; Kenneth A. Lies, Lubbock, and Jeffrey R. Teza, Houston, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed May 29, 1980, Ser. No. 154,342

Int. Cl.³ H03K *17/693*

U.S. Cl. 307—465 **5 Claims**



1. An integrated circuit coupled to means external to said integrated circuit including a plurality of coupling elements comprising:

(i) bus means for providing an address signal and a data signal,

(ii) interconnect means coupled to said bus means comprising a plurality of individual amplifiers for isolating, amplifying and re-outputting a received data signal in response to receiving a decode signal and a plurality of individual decoders each coupled to a corresponding amplifier for providing a decode signal in response to a particular address signal, said interconnect means selectively coupling the received data signal to a corresponding one of said coupling elements in response to decoding a particular address signal defined prior to its reception by said interconnect means.

4,430,585

TRISTATE TRANSISTOR LOGIC CIRCUIT WITH REDUCED POWER DISSIPATION

Edward W. Kirk, Jr., Lower Macungie Township, Lehigh County, Pa., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 30, 1981, Ser. No. 335,624

Int. Cl.³ H03K *19/088, 17/62*

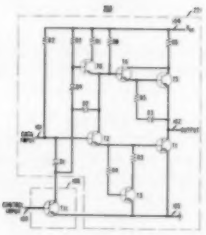
U.S. Cl. 307—473 **5 Claims**

1. A tristate logic circuit comprising:

data input means;

an output terminal;

control input means;
first and second terminals for receiving a first and a second operating voltage, respectively;
pullup means coupled between the first terminal and the output terminal for sourcing current from the first terminal to the output terminal when activated;
pulldown means coupled between the second terminal and the output terminal for sinking current from the output terminal to the second terminal when activated;
phase splitter means coupled between the first and second terminals and being responsive to a data signal from the data input means for selectively activating the pullup means or the pulldown means;



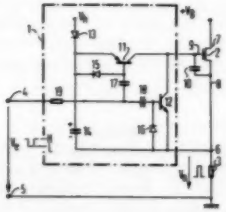
disabling means coupled to the control input means, the phase splitter means and the second terminal and being activated by a control signal from the control input means for sinking current from the phase splitter means to the second terminal so as to inactivate both the pullup means and the pulldown means;
characterized in that there are included power-down means coupled in series with the phase splitter means and to the disabling means for interrupting current flow through the phase splitter means and for providing a relatively high impedance current path from the first terminal to the disabling means in dependence upon the disabling means being activated.

4,430,586

SWITCH WITH AN MIS-FET OPERATED AS A SOURCE FOLLOWER

Ernst Hebenstreit, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed May 11, 1981, Ser. No. 262,648
Claims priority, application Fed. Rep. of Germany, May 14, 1980, 3018501
Int. Cl.³ H03K *17/12, 17/56, 17/687*
U.S. Cl. 307—570 **7 Claims**



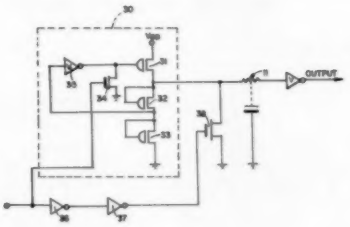
1. Switch, comprising an MIS-FET having a source and a control electrode defining a gate-source capacitance and being operated as a source follower for switching a given voltage; a first capacitor; a first auxiliary transistor; a second auxiliary transistor cutting off said first transistor when switched into a conducting state; said transistors each having a base, a collector and an emitter electrode defining a switching path; the collectors of each of said transistors being connected to the control electrode of said FET; a control input terminal; and second and third capacitors each being connected between said control input terminal and the bases of said first and second transistors, respectively; the emitter electrode of said second transistor being connected to the source electrode of said FET; said first capacitor having one lead connected to the emitter electrode of said second transistor and to the source electrode of said FET for charging the gate-source capacitance of said FET through the switching path of the first transistor, and another lead connected to the emitter electrode of said first transistor and to a terminal of a voltage source having a lower voltage than the given voltage to be switched by said FET for charging said first capacitor when said first transistor is cut off.

4,430,587

MOS FIXED DELAY CIRCUIT

Mark R. Tennyson, Anaheim, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Jan. 13, 1982, Ser. No. 339,030
Int. Cl.³ H03K *5/159, 3/01*
U.S. Cl. 307—590 **2 Claims**



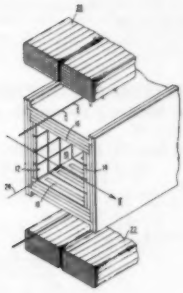
1. A MOS time delay circuit comprising:
a signal input;
a MOS regulated voltage supply circuit for supplying a voltage proportional to a predetermined trigger voltage;
a RC delay circuit having a first input connected to said regulated voltage supply circuit, and a second input connected to said signal input, and an output; and
a first variable trigger point inverter having an input connected to the output of said RC delay circuit, and an output comprising means for supplying a relatively positive first and a relatively negative second source of electric potential to said circuit; a first depletion mode FET having one conduction path terminal connected to said first source of electric potential, the other conduction path terminal connected to a first intermediate node, at its control terminal connected to said first intermediate node; a first enhancement mode FET having one conduction path terminal connected to said first intermediate node, the other conduction path terminal connected to a second intermediate node, and its control terminal connected to the output of said RC delay circuit; a second enhancement mode FET having one conduction path terminal connected to said second intermediate node, the other conduction path terminal connected to said second source of potential, and its control electrode connected to said output of said RC delay circuit; and a second depletion mode FET having one conduction path terminal connected to said first source of electrical potential, the other conduction path terminal connected to said second intermediate node, and its control terminal connected to said second intermediate node.

4,430,588

MHD ELECTRODE AND WALL CONSTRUCTIONS

Stewart Way, Columbia, Md., and Joseph Lempert, Penn Hills, Pa., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jun. 30, 1978, Ser. No. 921,021
Int. Cl.³ H02K 45/00
U.S. Cl. 310—11 2 Claims



1. An electrode construction adapted for use in a wall of an MHD channel in which a plasma flows at an operating temperature, comprising:

a ceramic holder being approximately one inch by one inch in lateral cross section, said holder being electrically insulating at said operating temperature;

a ceramic electrode contained within said holder and having a frontal face only exposed to said plasma, said electrode being electrically conductive at said operating temperature;

a metallic bar mounted to said holder and spaced from said plasma and said electrode;

means for conducting a current between said electrode and said bar; and

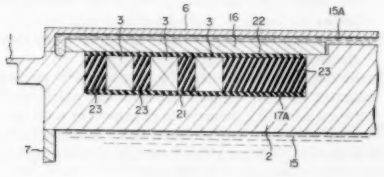
means for flowing a cooling fluid through said metallic bar.

4,430,589

ROTOR OF A SUPERCONDUCTIVE ROTARY ELECTRIC MACHINE

Masaki Sakuyama, Ashiya; Norio Oishi; Kouichi Okamoto, both of Kobe; Masatami Iwamoto; Tatsuei Nomura, both of Itami, and Shiro Nakamura, Takarazuka, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 31, 1982, Ser. No. 363,773
Claims priority, application Japan, Apr. 2, 1981, 56-50878; May 29, 1981, 56-84139
Int. Cl.³ H02K 9/00
U.S. Cl. 310—52 4 Claims



1. A rotor of a rotary electric machine comprising:

a coil-carrying shaft having a cylindrical outer surface having therein a plurality of parallel grooves running in the axial direction of the coil-carrying shaft and a pair of annular indentations running in the circumferential direction of the coil-carrying shaft, each of said indentations being connected to one end of each of said plurality of parallel grooves;

at least one winding formed of electrically conductive linear superconductive material having axially running portions disposed in said grooves and circumferentially running portions disposed in said indentations;

means for cooling said winding below a transition temperature of said superconductive material;

electrically insulating fillers fitted into spaces left by said winding in said indentations;

electrically insulating layers interposed between said circumferentially running portions of said winding and said indentations;

a pair of hollow cylindrical sleeves shrink fitted over said indentations onto said outer surfaces of said coil-carrying shaft; and

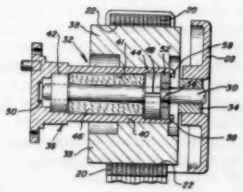
electrically insulating covers in said indentations between said circumferentially running portions of said winding and said shrink fitted sleeves, said shrink fitted sleeves tightly holding said electrically insulating layers, electrically insulating fillers, said circumferentially running coil portions and said insulating covers in said indentations.

4,430,590

ELECTRIC MOTOR WITH UNITARY ROTOR HOUSING

William L. Davis, Milford, Ill., assignor to MSL Industries, Inc., Milford, Ill.

Filed Feb. 5, 1982, Ser. No. 346,009
Int. Cl.³ H02K 7/00
U.S. Cl. 310—67 R 10 Claims



1. An electric motor, comprising:

a stator having a frame,

a rotor assembly, said rotor assembly including rotor housing means having an open end,

a rotor shaft fixedly cantilevered from said frame and fixed with respect to said stator for rotatably supporting said rotor assembly, said rotor shaft having a free end, and

retaining means disposed within said rotor housing means for holding said rotor assembly against axial movement on said rotor shaft, said retaining means being insertable through said open end during fabrication of said rotor assembly so that said rotor assembly is mountable on said rotor shaft after said shaft has been fixedly cantilevered from said frame by inserting said free end of said shaft into said open end and advancing the assembly axially along said rotor shaft until said retaining means cooperate with said rotor shaft to hold said rotor assembly against axial movement on said rotor shaft.

4,430,591

STATOR COIL OF A HIGH-VOLTAGE GENERATOR

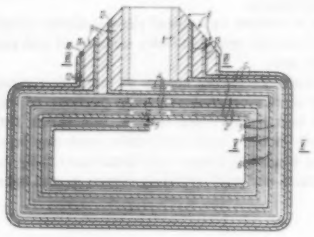
Tibor M. Nemeni, ulitsa Khalturinskaya, 11, kv. 245; Alexandr I. Nikolsky, ulitsa Dubninskaya, 14, korpus 2, kv. 59, and Sergei S. Mosolov, bulvar Yana Rainisa, 7, kv. 9, all of Moscow, U.S.S.R.

PCT No. PCT/SU80/00211, § 371 Date Aug. 23, 1982, § 102(e) Date Aug. 23, 1982, PCT Pub. No. WO82/02289, PCT Pub. Date Jul. 8, 1982

PCT Filed Dec. 24, 1980, Ser. No. 413,387

Int. Cl.³ H02K *11/00*

U.S. Cl. 310—71 1 Claim



1. A stator coil of a high-voltage generator, comprising an electrical lead-in of conductive material connected electrically to the beginning of a first turn of the coil, with the coil turns of conductive material being coated with several layers of turn-to-turn insulation having a screen layer applied on top, while the turn-to-turn insulation and the screen layer of each subsequent turn, starting with the first turn, envelop all the preceding turns, characterized in that the electrical lead-in (1) is fashioned as a tube while the stator coil of a high-voltage generator further comprises cooling pipe (3) adjoining the respective turns (2), closed at their ends and provided with side openings (4, 5) for the inlet and outlet of a cooling agent, insulating members (9) arranged concentrically with the electrical lead-in tube (1) and consisting of two parts (10, 11) made integral with each other, a first one (10) of said two parts facing the coil turns (2) presenting a half of a hollow cylinder separated from the latter by a diametral plane accommodating the longitudinal axis of said cylinder while a portion of said first part facing the coil turns (2) has two projections (15) provided each on the inner side thereof with holes (16) communicated with the side openings (4 or 5) in the cooling pipes (3), a second part (11) of the insulating member presenting a half of a truncated hollow cone separated from the latter by a diametral plane accommodating the longitudinal axis of said truncated cone coinciding with the longitudinal axis of said cylinder, the greater base of the second part (11) coinciding with the base of the first part (10) most removed from the coil turns (2), the insulating member (9) being further provided along the axis thereof with passages (14) communicated with spaces (17) in the projections (15), insulating tubes (8) for the supply of the cooling agent, each one of said insulating tubes formed by a pair of insulating members (9) being made of two parts integral with each other, one of said parts presenting a hollow cylinder with projections facing the coil turns while the other one of said parts presents a truncated hollow cone whose greater base coincides with the base of cylinder most removed from the coil turns (2), the holes (16) in the projections (15) of one of the insulating members (9) communicating with the corresponding side openings (4) of the cooling pipe (3) for the inlet of the cooling agent and the holes (16) in the projections (15) of the other insulating member (9) communicating with the corresponding side openings (5) provided in the same cooling pipe (3) for the outlet of the cooling agent, while each insulating tube (8) for the supply of the cooling agent is separated from the subsequent tube by several insulation layers (12) presenting a continuation of the corresponding layers (6) of turn-to-turn insulation, with a screen layer (13) applied on top and presenting an unbroken continuation of the corresponding screen layer (7) of the turn-to-turn insulation layers (6), the truncated cone of the insulating tube (8) for the supply of the cooling agent adjoining the electrical lead-in tube (1) being most removed from the first turn (2) of the coil while the truncated cone of each subsequent insulating tube (8) for the supply of the cooling agent tightly adjoining the preceding insulation layers is less removed from the first turn (2) of the coil and the greater bases of the truncated cones of the insulating tubes (8) for the supply of the cooling agent are located at a preset distance from each other.

4,430,592

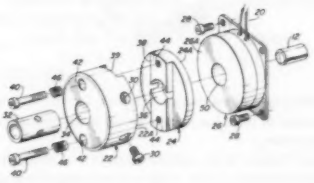
ELECTROMAGNETIC BRAKE

Peter Manktelow, McHenry Shores, Ill., assignor to Tape Research, Inc., Cary, Ill.

Filed Aug. 31, 1981, Ser. No. 297,763

Int. Cl.³ F16D *27/04*

U.S. Cl. 310—93 2 Claims



1. An electromagnetic brake for use with an electric motor having a stator and a rotatable drive shaft, said brake comprising in combination

an electromagnet mounted in fixed relationship with said stator

and having an opening through which said shaft rotatably extends;

a non-magnetic support member affixed to said shaft in spaced relationship with said electromagnet for rotation with said shaft;

said support member including:

a generally cylindrical block member having a central bore receiving a tubular bushing into which said shaft extends and which extends into a central bore in said disc member, radially extending screw means extending through said block member into engagement with said shaft for fixing said block member to said shaft, a plurality of countersunk holes extending through said block member in parallel relationship with said shaft, a plurality of headed screws slidably extending through said holes into threaded engagement with said brake disc member, and said coil springs respectively surrounding the shanks of said screws and being compressed between the heads of said screws and said block member to bias said screws in an axial direction away from said electromagnet;

a brake disc member formed of a ferromagnetic material and mounted to said support member for axial movement between a braking position in engagement with said electromagnet when said electromagnet is energized and a non-braking position away from said electromagnet when said electromagnet is deenergized;

mutually interlocking means on said support member and on said disc member for preventing relative rotation between said disc member and said support member;

said interlocking means including a diametrically extending groove in one of said members, and a diametrically extending rib on the other of said members; and

spring means carried by said support member for resiliently

biasing said disc member toward said non-braking position.

4,430,593

ACOUSTIC TRANSDUCER

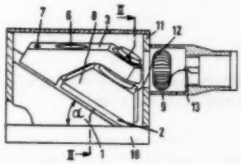
Christian Göhlert, Bergisch Gladbach; Peter Kanngiesser, Overath-Steinenbrück; Hansjakob Weiss, Bergisch Gladbach, and Werner Wilke, Cologne, all of Fed. Rep. of Germany, assignors to Interatom, Internationale Atomreaktorbau GmbH, Bergisch Gladbach, Fed. Rep. of Germany

Filed Dec. 17, 1980, Ser. No. 217,408

Claims priority, application Fed. Rep. of Germany, Dec. 19, 1979, 2951075

Int. Cl.³ H01L *41/08*

U.S. Cl. 310—327 **12 Claims**



1. Acoustic transducer having a piezo-electric element, comprising a lead section having a region connected to a piezo-electric element having a given surge impedance and said lead section having another region for coupling to a medium to be tested having another given surge impedance, said lead section being in the form of a metallic body having pores formed therein and having a sound interface, the number and size of said pores being adjusted for providing a surge impedance in vicinity of said sound interface being between the surge impedances of the piezo-electric element and the medium to be coupled thereto.

4,430,594

DEVICE FOR CONTACTING TUBULAR PIEZO-ELECTRIC TRANSDUCERS

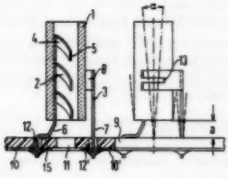
Klaus Bork; Rolf Humbs, and Karl Trey, all of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Feb. 9, 1983, Ser. No. 465,120

Claims priority, application Fed. Rep. of Germany, Mar. 10, 1982, 3208679

Int. Cl.³ H01L *41/08*; G01D *15/18*

U.S. Cl. 310—328 **5 Claims**



1. A device for contacting each of a plurality of tubular piezo-electrical transducer elements which are arranged in rows and encapsulated in a synthetic material to form a printing head for an ink printing device, said device comprising a printed circuit board; a first contacting element and a second contacting element for each transducer element, each of the first contacting elements consisting of an inside contact sleeve having a contact surface resiliently pressing against an inside wall surface of a transducer element, said inside contact sleeve being connected to a flexible spacer extending out of the transducer element, each of the second contact elements comprising a resilient connector with a resilient clamp for elastically embracing the outside of the transducer element extending therefrom, said circuit board having a row of feedthrough holes for each row of elements with one feedthrough hole for each of the transducer elements, each feedthrough hole having a first acceptance opening extending into an electrical conductor path and a second acceptance opening extending into a different conductor path; means for securing the flexible spacer of each first conducting element in the first openings and in electrical contact with the conductor path associated therewith; and means for securing each of the resilient connectors of the second conducting elements in the respective second openings and in electrical contact with the conductor path associated therewith so that each of the transducer elements are situated at a fixed distance from each of the feedthrough holes and aligned therewith.

4,430,595

PIEZO-ELECTRIC PUSH BUTTON SWITCH

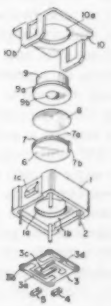
Hiroyuki Nakasone, Tokyo, and Takayasu Sakamoto, Kawagoe, both of Japan, assignors to Toko Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 4, 1982, Ser. No. 405,156

Claims priority, application Japan, Aug. 7, 1981, 56-117874[U]; Aug. 7, 1981, 56-117875[U]

Int. Cl.³ H01L *41/08*

U.S. Cl. 310—339 **4 Claims**



1. A piezo-electric push button switch comprising:

a housing having a plurality of terminals embedded therein;

a depressing member which is movably mounted in said housing;

a flexible printed circuit board in said housing which electrically is conductively secured to said terminals for being mounted thereon;

an electrically conductive plate in said housing between said circuit board and said depressing member and having a plate part and a lead part, said lead part being electrically conductively secured to said flexible printed circuit board;

a piezo-electric plate which has electrodes on both surfaces thereof and is polarized in the direction of the thickness thereof, said piezo-electric plate being fixedly secured to the surface of said electrically conductive plate which is toward said circuit board;

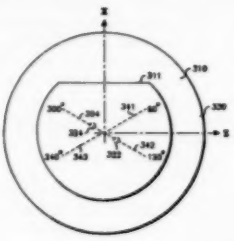
a further lead part between said flexible printed circuit board and said electrode on said piezo-electric plate which is toward said flexible circuit board and mechanically and electrically conductively connecting said electrode and said circuit board; and

striking means constituted by a dome-shaped metal spring and interposed between said depressing member and said electrically conductive plate and which is deformed by depression of said depressing member to thereby strike a blow on said electrically conductive plate.

4,430,596
TEMPERATURE INSENSITIVE PIEZOELECTRIC CRYSTAL MOUNTING ARRANGEMENT

Charles W. Shanley, Plantation, Fla., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 16, 1982, Ser. No. 408,409
Int. Cl.³ H01L 41/08
U.S. Cl. 310—348 16 Claims



1. A piezoelectric crystal mounting arrangement comprising:

a substrate of electrically insulative material;

an AT cut piezoelectric crystal plate having a center and opposed upper and lower surfaces with at least one electrode disposed on the upper surface of said crystal plate and at least one electrode disposed on the lower surface of said crystal plate, said crystal plate exhibiting X, Y, and Z reference coordinate axes, and

four support pedestals, each pedestal being situated on said substrate and being oriented so as to contact and support said crystal plate along a respective one of four axes of said crystal plate situated at angles of approximately 60°, 120°, 240°, and 300° with respect to the X axis of said crystal plate, the angle of each of said axes being selected to minimize stress exerted on said crystal plate by the differential thermal expansion of said crystal plate with respect to said substrate and pedestals, said four pedestals being substantially centrally situated on said crystal plate, said four pedestals being arranged on said substrate so as to form the four corners of a four-sided polygon, the center of said crystal plate being situated above and laterally within said four-sided polygon formed by said pedestals.

4,430,597
AMBIENT PRESSURE LAMP

William E. Thompson, R.R. 1, Box 89, Middletown, Ind. 47356

Filed Jul. 2, 1981, Ser. No. 280,112
Int. Cl.³ H01K 1/18, 1/34, 1/52
U.S. Cl. 313—113 10 Claims

1. An ambient pressure lamp comprising:

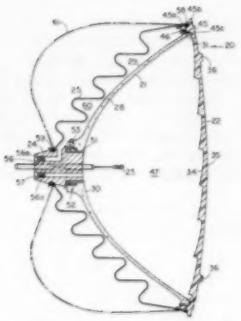
a reflector member having an inner reflective surface, an outer surface, a base portion and an outer peripheral edge;

an enclosing cover member having an outer peripheral lip portion, said lip portion being assembled to said outer peripheral edge so as to define an inner chamber between said inner reflective surface and said enclosing cover member;

a lamp filament;

a lamp socket assembled to said reflector member adjacent said base portion and cooperatively adapted for receipt of said lamp filament; and

an expandable membrane sealingly joined around said outer surface and around said filament socket so as to define an expansion chamber between said outer surface and said expandable membrane, said expansion chamber being

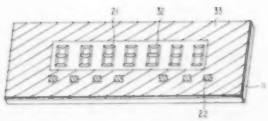


completely enclosed except for being in flow communication with said inner chamber.

4,430,598
FLUORESCENT DISPLAY TUBE

Toshio Okada; Katsumi Motoyama, and Takashi Yoshii, all of Izumi, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Jun. 24, 1981, Ser. No. 276,741
Claims priority, application Japan, Jun. 24, 1980, 55-88241[U]
Int. Cl.³ H01J 1/62, 63/04
U.S. Cl. 313—497 7 Claims



1. A fluorescent display tube comprising:

a hermetically sealed casing having a substrate and a transparent window opposing each other, said substrate having different colored first and second background regions on its surface opposing said window, said first background region being surrounded by said second background region,

a filament disposed between said substrate and window,

a grid disposed between said substrate and filament, said grid having a mesh portion opposing said first background region,

a plurality of anode segments provided within said first background region and opposing said mesh portion,

a layer of a fluorescent material provided on each of said anode segments and having a color similar to that of said first background region,

external electrodes fixed to said casing, and

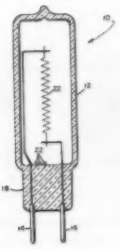
lead means for electrically connecting said filament, grid and anode segments to said external electrodes, the exposed portions of said lead means being located on said second background region and having a color similar to that of said second background region, whereby the readability of the displayed information in a bright environment is improved and the exposed portion of said lead means is indistinct against said second background region and thus achieving an excellent display quality.

4,430,599

TUNGSTEN-HALOGEN LAMP WITH FREE FLOATING GETTER

Carl F. Kackenmeister, Williamsport, Pa., assignor to GTE Products Corporation, Stamford, Conn.

Filed Apr. 28, 1982, Ser. No. 372,594
Int. Cl.³ H01K 1/50, 1/56
U.S. Cl. 313—554 3 Claims



1. A tungsten-halogen incandescent lamp comprising: a light transmitting, hermetically sealed, glass envelope; two lead-in wires sealed in said envelope at a glass press and extending internally and externally of said envelope; a tungsten filament attached between the internal ends of said lead-in wires; a fill gas within said envelope comprising an inert gas and a halogen; and a quantity of loose copper particles within said envelope.

4,430,600

MODULAR LOW ASPECT RATIO-HIGH BETA TORSATRON

George V. Sheffield, Hopewell, and Harold P. Furth, Princeton, both of N.J., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

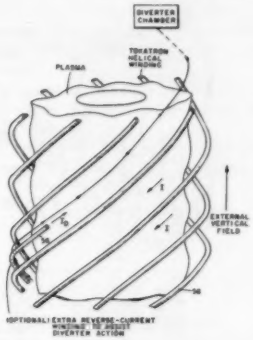
Filed Apr. 1, 1982, Ser. No. 364,276
Int. Cl.³ H01J 7/24; G21B 1/00
U.S. Cl. 315—111.71 15 Claims

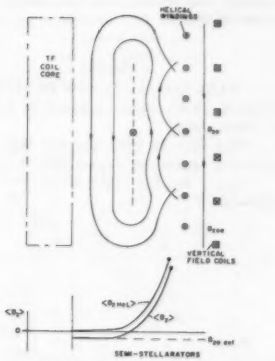
1. A device for magnetically confining a plasma, comprising;

semi-torsatron coil means, including a plurality, n in number, of electrically conductive coils, for generating a first toroidal field and a first poloidal field within said toroid, said plurality of coils forming closed loops in separate spaced-apart planes i, i=1 . . . n, n being a positive integer greater than 2;

each of said plurality of coils surrounding and lying on the boundary of said toroid, said toroid having a major axis, and a minor axis encircling said major axis lying in the equatorial midplane perpendicular to said major axis;

the cylindrical coordinates of every point (r,ϕ,z) in each of said planes having a relationship $\phi=\phi_i+kz$ where z is measured along said major axis, ϕ is an angle measured





along said minor axis, k is a constant and ϕ_i is the value of ϕ in the i'th plane at z equal to zero.

4,430,601

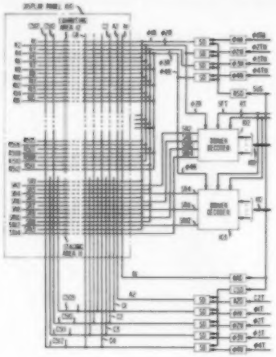
SELECTIVE SHIFTING AC PLASMA PANEL

Gary D. Boyd, Rumson, and Peter D. T. Ngo, Colts Neck, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 5, 1982, Ser. No. 365,252
Int. Cl.³ H05B 41/00
U.S. Cl. 315—169.4 8 Claims

1. A plasma panel display of the type being capable of charge cloud transportation in response to the output of driver circuitry for propagating the status of display data between site locations, said plasma display having at least a first conductor arrangement in a first portion of the panel and a second conductor arrangement in a second portion of the panel, the first and second portions having common continuous conductors

extending between the two portions, and each conductor arrangement serving to provide selective propagation of the



status of display data between site locations in its portion in a predetermined direction.

4,430,602

ELECTRONIC FLASH DEVICE

Kouichi Ohmori, Zushi, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 28, 1982, Ser. No. 383,247

Claims priority, application Japan, Jun. 11, 1981, 56-88899

Int. Cl.³ H05B *41/32*

U.S. Cl. 315—241 P **8 Claims**

1. An electronic flash device comprising:
(a) a DC-DC converter for boosting the output of a battery;
(b) a capacitor to be charged with the output of said converter and for storing electrical energy to be converted into light energy;
(c) a neon tube for becoming operative when the charge of the capacitor reaches a first predetermined level; and
(d) control means for rendering said converter inoperative in response to said neon tube becoming operative and to render the converter operative again when the charge of the capacitor drops to the first predetermined level after the neon tube becomes operative.

4,430,603

BRUSHLESS DIRECT CURRENT MOTOR HAVING A ONCE-AROUND PULSE GENERATING MEANS

Rolf Müller, Ackerstr. 13, DT-7742 St. Georgen, Fed. Rep. of Germany

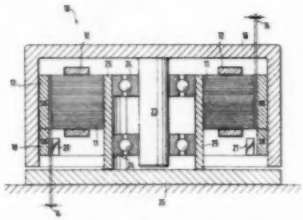
Filed Jul. 17, 1981, Ser. No. 284,385

Claims priority, application Switzerland, Jul. 18, 1980, 5498/80

Int. Cl.³ G05B *19/40*

U.S. Cl. 318—254 **10 Claims**

1. In a brushless direct current motor including a rotor, a stator, said rotor supporting a permanently magnetized exciter magnet having at least two pairs of poles and a permanently magnetized control magnet, the poles being alternately magnetized in a circumferential direction, said stator supporting a winding means, and commutating means for controlling the current to the winding means, means for supplying a commutation signal to said commutating means and providing a once-around rotor position control signal, said means comprising two rotary position detectors circumferentially spaced the



path of movement of the control magnet and each being responsive to the magnetic field of the control magnet to provide an output signal, first circuit means responsive to said output signals to generate a commutation signal having one pulse for each pair of poles for each revolution of the rotor, and second circuit means responsive to at least one of said output signals to generate only one control signal for each revolution of the rotor.

4,430,604

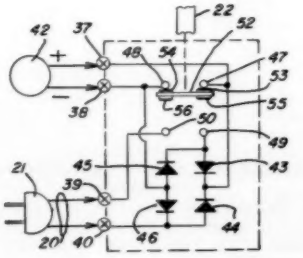
RECTIFIER SWITCH FOR ELECTRIC LAWN MOWERS

Ernest L. Loganbill, and William E. Taylor, both of Independence, Kans., assignors to Echlin Inc., Branford, Conn.

Filed Mar. 24, 1982, Ser. No. 361,143

Int. Cl.³ H02P *3/12*

U.S. Cl. 318—379 **12 Claims**

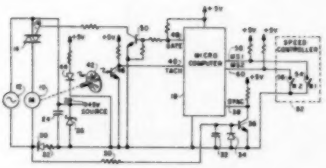


1. A switch for energization of a DC motor of an electric mower or the like from AC supply lines, comprising: a switch housing, terminals accessible from the outside of said housing for connection to said motor and to said AC supply lines, contact means within said housing, an actuating member mechanically connected to said contact means and having a portion projecting from said housing for actuation of said contact means between an off condition and an on condition, rectifier means within said housing, and connection means within said housing connecting said contact means and said rectifier means and said terminals for connecting said motor through said rectifier means to said AC supply lines in said on condition of said contact means and for short circuiting said motor in said off condition of said contact means.

4,430,605
MOTOR CONTROL SYSTEM UTILIZING SWITCHED CONTROLLER

Bruce E. Arnold, Clinton, N.J., assignor to The Singer Company, Stamford, Conn.

Filed Jun. 22, 1981, Ser. No. 276,435
Int. Cl.³ H02P 3/06
U.S. Cl. 318—386 7 Claims

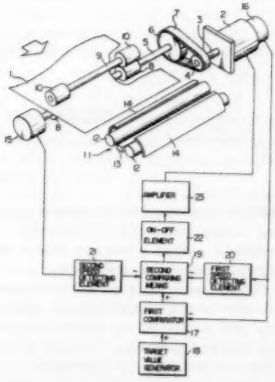


1. A system for controlling the speed of a motor comprising:
switching apparatus selectively settable to any of four states;
operator actuable means for setting said switching apparatus to a desired one of said states, said operator actuable means being arranged to effect changes between states of said switching apparatus only in a defined order;
stopping means responsive to said switching apparatus being in a first of said states for stopping said motor;
decelleration means responsive to said switching apparatus being in a second of said states for decreasing the speed of said motor;
speed maintaining means responsive to said switching apparatus being in a third of said states for maintaining constant the speed of said motor; and
accellerating means responsive to said switching apparatus being in a fourth of said states for increasing the speed of said motor.

4,430,606
SHEET FEEDING APPARATUS

Harnaki Otsuki; Hiromu Hirai, both of Ibaraki, and Masataka Kawanchi, Ishioka, all of Japan, assignors to Hitachi, Ltd.

Filed Aug. 28, 1981, Ser. No. 297,404
Claims priority, application Japan, Sep. 8, 1980, 55-123566
Int. Cl.³ G05B 19/28
U.S. Cl. 318—601 10 Claims

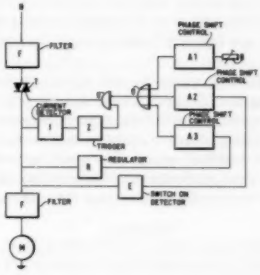


1. A sheet feeding apparatus for transmitting the rotation of a motor shaft of a motor to a sheet feeding shaft for feeding a sheet by an elastic transmission mechanism, comprising:
a target value generator for generating a target position signal;
a position detector for detecting the position of at least either of said sheet shaft or said motor shaft as a signal;
first comparing means for comparing said two signals to produce a signal indicative of a positional deviation;
a speed detecting element for generating a signal indicative of a speed of at least either of said sheet shaft or said motor shaft;
second comparing means for comparing said positional deviation signal and a signal indicative of the speed to produce a deviation signal therebetween; and
control means for controlling said motor in accordance with the deviation signal from said second comparing means.

4,430,607
CIRCUIT ARRANGEMENT

Wolfgang Muth, Erich-Ollenhauerstrasse 50B, 6200 Wiesbaden, Fed. Rep. of Germany

Filed May 18, 1982, Ser. No. 379,454
Claims priority, application Fed. Rep. of Germany, May 18, 1981, 3120141
Int. Cl.³ G05F 1/70
U.S. Cl. 323—217 5 Claims



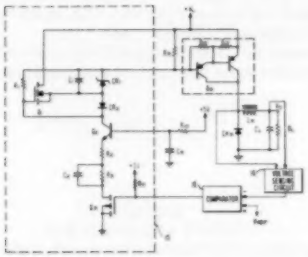
1. A circuit arrangement for continuously adjusting the power intake to a load with respect to the power demand of the load comprising:
a voltage control power switch connected in series with the load;
means for detecting the instantaneous phase shift between the load current and voltage, the phase shift detecting means generating an output in proportion to the amount of the detected phase shifts;
first phase shift control means, responsive to the output of the phase shift detecting means, for generating a control signal for controlling the phase angle of conduction of the power switch to reduce the load current upon increasing phase shift between the load current and voltage;
switch on detector means for detecting a switch-on of the load, the switch-on detector means generating an output for a pre-determined period of time after the load is switched on;
second phase shift control means, responsive to the output of the switch on detector menas, for generating a control signal suppressing conduction of the power switch for a pre-determined time after the switch-on of the load; and
logic means, responsive to the control signals from the first and second phase shift control means, for generating an output control signal upon receiving an input from one of the first and second phase shift control means for controlling the phase angle of conduction of the power switch.

4,430,608

BASE DRIVE CIRCUIT

John J. Nesler, Los Angeles, Calif., assignor to Hughes Aircraft Company, El Segundo, Calif.

Filed Dec. 22, 1981, Ser. No. 333,355
Int. Cl.³ G05F 1/56
U.S. Cl. 323—282 16 Claims



1. In a power supply having a power transistor with at least three terminals and means for sensing the output at the first terminal thereof, a circuit for providing forward and reverse base drive for the power transistor comprising:

first switching means coupled to the means for sensing the output of the power transistor for selectively closing a direct current path from a second terminal of the power transistor to a first terminal to provide forward base drive therefor;

current regulating means in said direct current path for minimizing the effect of variations in the potential applied at the second terminal of the power transistor; and

second switching means coupled to said current path and a source of potential energy for applying said source of potential energy to the second terminal of the power transistor to provide reverse base drive therefor.

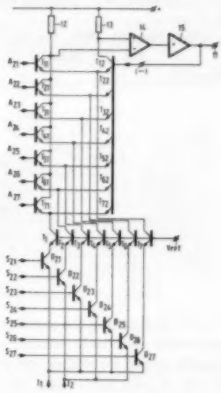
4,430,609

SIGNAL TRANSFER DEVICE HAVING A TRANSFER CHARACTERISTIC WHICH IS ADJUSTABLE IN STEPS

Theodorus J. Van Kessel; Else C. Dijkmans, and Albertus J. P. M. Van Uden, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 21, 1981, Ser. No. 332,896
Claims priority, application Netherlands, Jan. 7, 1981, 8100033
Int. Cl.³ H03G 3/30
U.S. Cl. 323—350 14 Claims

1. A signal transfer device having a transfer characteristic which is adjustable in steps comprising, at least one group of controllable switches for transferring a signal from different inputs to an output, control means for turning on said switches one at a time with the switches being turned on and off by means of a control signal, and a control-signal generator for generating a first control signal which gradually varies in time for gradually turning on a specific switch of said group, and for generating a second control signal complementary to the first



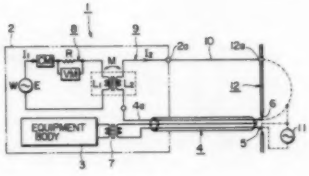
control signal for at the same time gradually turning off another switch of said group.

4,430,610

NON-GROUNDING CHECKING SYSTEM

Kenichi Yoshida; Junichi Hiramoto, and Shinya Takenaka, all of Osaka, Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Dec. 22, 1981, Ser. No. 333,509
Claims priority, application Japan, Dec. 22, 1980, 55-180471
Int. Cl.³ G01R 31/02
U.S. Cl. 324—51 4 Claims



1. In an electrical apparatus having a power cord with a first grounding line therein, said apparatus having a grounding terminal to which a second grounding line is connected, a non-grounding checking circuit comprising:

a primary circuit including a primary coil and electrical source for providing a current through said primary coil;

a secondary coil connected in series between said first grounding line and grounding terminal inductively coupled to said primary coil, the impedance of said primary circuit indicating the grounding state of said electrical apparatus; and

means for detecting a magnitude of said current in said primary coil to provide an indication of said grounding state.

4,430,611
FREQUENCY SPECTRUM ANALYZER WITH PHASE-LOCK

Thomas J. Boland, Idaho Falls, Id., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jul. 29, 1981, Ser. No. 288,234
Int. Cl.³ G01R *23/16*
U.S. Cl. 324—77 C **8 Claims**

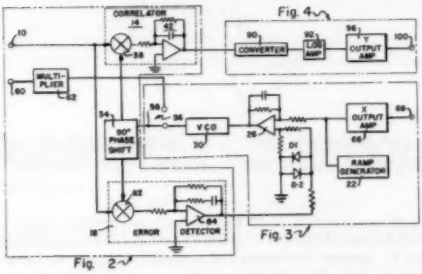


Fig. 2 Fig. 3 Fig. 4

1. A sweep frequency spectrum analyzer for determining the frequency spectrum components of an input signal comprising:

a cross correlator means having first and second input means and an output means;

a phase detector means having first and second input means and producing an error signal at an output means;

sweep frequency means having an input means for coupling to an error signal, said sweep frequency means responsive to said error signal to produce a sweep frequency signal whose frequency is proportional to said error signal;

means for coupling the input signal to said first input means of said cross correlator means and said phase detector means;

means for coupling said sweep frequency signal to said second input means of said said cross correlator means and said phase detector means;

means for coupling said input of said sweep frequency means to said error signal of said phase detector means;

said phase detector means and said sweep frequency means comprising a phase lock loop which matches the phase of the sweep frequency signal to the phase of said input signal for a predetermined time period; and

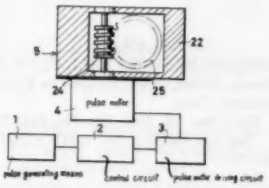
said cross correlator output means producing during said predetermined time period, an output signal which is directly proportional to the maximum amplitude of a frequency spectrum component of said input signal.

4,430,612
ELECTRIC TYPE SPEED METER

Nobuyuki Onitsuka; Masaaki Fukamachi, and Masahiko Sueyoshi, all of Miyazaki, Japan, assignors to Kabushiki Kaisha Honda Rukku, Miyazaki, Japan

Filed Sep. 22, 1981, Ser. No. 304,569
Claims priority, application Japan, Sep. 22, 1980, 55-130599
Int. Cl.³ G01P *3/489*
U.S. Cl. 324—166 **2 Claims**

1. An electric speed meter comprising a pulse generating means for generating a pulse signal corresponding to a vehicle speed, a control circuit means for counting the number of output pulses of the pulse generating means during predetermined time intervals and for discriminating between a positive and negative difference between the number of pulses counted during a predetermined time interval and the number of pulses counted in a preceding time interval and for generating a pulse signal corresponding to the difference therebetween, a pulse motor driving circuit for applying in sequence the output pulses of the control circuit means to a pulse motor for controlling the pulse motor in either a forward direction or a reverse direction and an indicator means operable in response to the pulse motor for indicating a speed corresponding to the speed of the vehicle, wherein said control circuit means comprises a counter means for counting the number of pulses generated by the pulse generating means, holding circuit means for counting and holding the number of pulses counted by the counter means during the predetermined time interval and a preceding time interval, a first comparator means coupled to the pulse motor for discriminating between the positive and negative difference of the values of the holding circuit means and generating either a forward rotational signal or a reverse rotational sigal for the pulse motor, subtractor circuit means coupled to

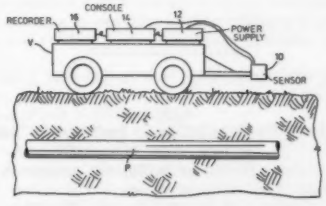


the holding circuit means for providing a difference between the number of pulses counted during each time interval and during the preceding time interval, oscillator means for generating pulses corresponding to a predetermined motor rotational speed, second counter means for counting the number of pulses applied to the pulse motor by the oscillator means, second comparator means for comparing the output of the subtractor means and the second counter means and an AND circuit having one input coupled to the oscillator means and the other input coupled to the second comparator means and the output thereof coupled to the motor and the second counter means, wherein the number of pulses applied to the motor by the oscillator means is controlled and the rotational speed of the motor is thereby controlled.

4,430,613
PIPELINE INSPECTION AND MAINTENANCE METHOD INCLUDING MOVING A MAGNETIC FIELD RESPONSIVE DEVICE ALONG THE ROUTE OF THE PIPELINE

Hartley A. French, 67 Aldershot Crescent, Willowdale, Ontario, Canada

Filed Jul. 28, 1980, Ser. No. 172,796
Int. Cl.³ G01R *33/12*; G01N *27/72*
U.S. Cl. 324—200 **8 Claims**



1. A method of inspecting and maintaining a pipeline including the steps of passing an inspection pig through the pipeline and making a record of the pipeline characteristics observed by said pig including areas of said pipeline suspected of weakness and of specific identifiable features of the pipeline; recording the output of an odometer carried by said pig so that the observed characteristics can be related to said recording of the output of the odometer;

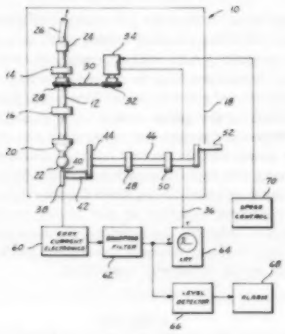
moving a magnetic field responsive device along the route of the pipeline and exterior of the pipeline, identifying the geographical location of a selected one of said specific identifiable features of the pipeline using that device, correlating that feature with the same feature in the record and observing the distance between that feature and an area of suspected weaknesses recorded by said odometer and, using the geographical location of said feature as a datum from which to measure off said distance, finding the geographical location of said area suspected of weakness.

4,430,614

EDDY CURRENT BEARING BALL FLAW DETECTOR

Charles V. Gereg, Bethel, Conn., assignor to The Barden Corporation, Danbury, Conn.

Filed Dec. 10, 1980, Ser. No. 214,777
Int. Cl.³ G01N *27/82*; G01R *33/00*
U.S. Cl. 324—238 **9 Claims**



1. Apparatus for inspecting the surface of a generally spherical article having a center including in combination first means operable to rigidly hold said article, an inspection probe, means for positioning said probe in contact with the surface of said article, means for rotating said first means about a first axis passing substantially through said center to cause said probe to scan a strip of said surface, and means including means for revolving said positioning means about a second axis passing substantially through said center to vary the location of said strip.

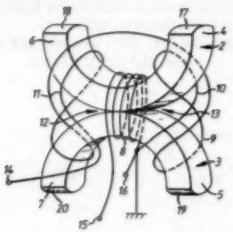
4,430,615

REFLECTION TYPE PROBES FOR EDDY CURRENT TESTING INSTRUMENTS

John H. Calvert, Hertfordshire, England, assignor to Hocking Electronics Limited, Great Britain

Filed Aug. 13, 1981, Ser. No. 292,628
Claims priority, application United Kingdom, Aug. 23, 1981, 8027498
Int. Cl.³ G01N *27/72*; G01R *33/12*; H01F *27/28, 27/38*
U.S. Cl. 324—239 **6 Claims**

1. A reflection type probe for use with an eddy current testing instrument, said probe comprising a ferromagnetic core, a driver coil system and a pick-up coil system, both of said systems being mounted on the core, said core having four limbs each with a free end, one of said coil systems being wound on the four limbs with its turns equally distributed between the four limbs and the other coil system being wound



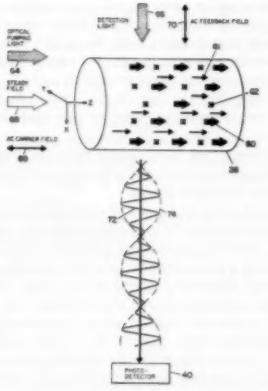
on a part of the core remote from the turns of said one coil system and which interconnects the core limbs at least in pairs.

4,430,616

NUCLEAR MAGNETIC RESONANCE GYRO SCOPE

Bruce C. Grover, Thousand Oaks, Calif., assignor to Litton Systems, Inc., Beverly Hills, Calif.

Continuation-in-part of Ser. No. 162,337, Jun. 23, 1980, abandoned. This application Jan. 29, 1982, Ser. No. 344,249
Int. Cl.³ G01R *33/08*
U.S. Cl. 324—304 **6 Claims**



1. In a nuclear magnetic resonance detection device including a nuclear magnetic resonance cell, a gas vapor of a first optically pumpable substance that possesses a magnetic moment and is capable of being optically pumped, said pumpable substance being contained in said cell, at least one nuclear moment gas each having a nuclear magnetic moment also contained in said cell, the nuclear magnetic moments of each said nuclear moment gas being at least partly aligned, means for applying a steady magnetic field to said cell, first means for illuminating said cell with pumping light capable of partly aligning the magnetic moments of said optically pumpable substance in one direction by absorption of said light, means for precessing said aligned nuclear magnetic moments of each said nuclear moment gas about the direction of the steady magnetic field at the respective Larmor precession frequencies of each said nuclear moment gas, means for applying an AC carrier magnetic field to said cell, the improvement comprising:

a gas vapor of a second optically pumpable substance that possess a magnetic moment and is capable of being opti-

cally pumped, said second optically pumpable substance being contained in said cell;

second means for illuminating said cell with detection light of a wavelength approximately equal to a wavelength which can be absorbed by said second optically pumpable substance;

means for applying said detection light with a component orthogonal to the direction of said AC carrier magnetic field to produce modulations in the intensity of the transmitted part of said detection light substantially at the frequency of at least one harmonic, including the fundamental of said AC carrier magnetic field; and

means for detecting at least one of said modulations in the intensity of the transmitted part of said detection light.

4,430,617

CLOCK GENERATOR

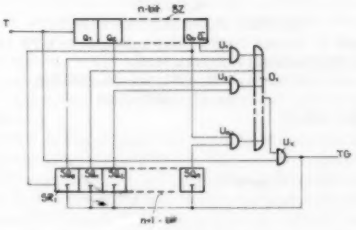
Joachim Kuhlmann, Heilbronn, Fed. Rep. of Germany, assignor to TELEFUNKEN electronic GmbH, Heilbronn, Fed. Rep. of Germany

Filed Dec. 2, 1981, Ser. No. 326,923

Claims priority, application Fed. Rep. of Germany, Dec. 12, 1980, 3046772

Int. Cl.³ H03K *3/78, 3/017, 3/86*

U.S. Cl. 328—61 **5 Claims**



1. A clock generator comprising: a binary counter having n-stages and an input to which is supplied a basic clock signal with separate timing pulses at a constant period; a shift register having a complete shift interval and n+1 stages; and a logic circuit having an output and linking the individual stages of said shift register and of said binary counter together so that a clock output signal, which has a period which increases in binary form during one complete shift interval of the shift register and a period ratio such as (1:1:2:4:8: . . . :2n) as compared to the basic clock signal, appears at said output of said logic circuit; and wherein said logic circuit has an OR gate an n+1 AND gates, said OR gate has n+1 inputs with n of said inputs being formed by the outputs of n of said AND gates, each of said n AND gates connects one stage of said binary counter with a corresponding stage of said shift register, the logic signal in one of said stages of said shift register is applied directly to the n+1th input of said OR gate, the n+1th AND gate has inputs connected to the output of said OR gate and to said basic clock signal, and said clock output signal appears at the output of said n+1th AND gate.

4,430,618

INPUT BUFFER CIRCUIT

Hisami Mitsueda, Toyota; Kazuyoshi Tamaki, Nagoya, and Hiromi Ariyoshi, Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jul. 30, 1981, Ser. No. 288,373

Claims priority, application Japan, Aug. 4, 1980, 55-106997

Int. Cl.³ H03K *5/24, 17/16*

U.S. Cl. 328—149 **2 Claims**

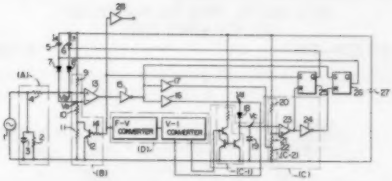
1. An input buffer circuit comprising:

a filter circuit for eliminating noise included in a signal from a signal source;

a voltage setting circuit for establishing a first and a second predetermined voltage;

a comparator circuit for comparing an output signal of said filter circuit with each of said predetermined voltages to generate a comparison output signal;

flip-flop circuit means responsive to said comparison output signal of said comparator circuit to generate a gate signal;



constant current circuit means responsive to said gate signal to selectively supply a third and a fourth predetermined voltage to said comparator circuit;

frequency-to-current converter means for converting said comparison output signal to a current signal corresponding to the frequency thereof; and

time setting circuit means responsive to said current signal to determine a holding time of said third and fourth predetermined voltages, respectively.

4,430,619

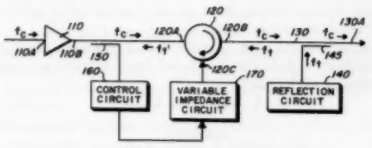
ADAPTIVE RADIO FREQUENCY INTERMODULATION MINIMIZING APPARATUS

Robert L. Epsom, Hanover Park; Paul H. Gailus, Chicago, and Anthony P. van den Heuvel, Arlington Heights, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 31, 1981, Ser. No. 336,194

Int. Cl.³ H03F *1/26;* **H04B** *15/00*

U.S. Cl. 330—149 **13 Claims**



1. An apparatus for inhibiting generation of intermodulation products affecting an amplifier circuit amplifying a radio frequency signal exhibiting a predetermined frequency comprising:

a circulator including at least input, output and isolation ports, said input port being electrically coupled to the output of said amplifier;

reflection circuit means, electrically coupled to the output port of said circulator, for generating a reflected radio frequency signal coupled back to said circulator output port, said reflected radio frequency signal exhibiting a frequency sufficiently different from said predetermined frequency signal so as to be distinguishable therefrom, said reflection circuit means being adapted to couple said predetermined radio frequency signal to an antenna;

control circuit means, electrically coupled to said amplifier, for generating a control signal exhibiting indicia of the portion of the reflected radio frequency signal reaching the input port of said circulator, and

electronically variable impedance means, coupled to the isolation port of said circulator and to said control circuit

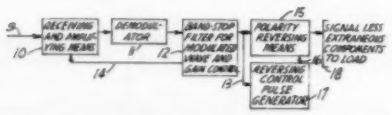
means, for providing an appropriate impedance to said isolation port in response to said control signal such that the isolation achieved by said circulator is maximized.

4,430,620

DEMODULATOR SYSTEM FOR DOUBLE SIDEBAND SUPPRESSED CARRIER AMPLITUDE MODULATION

Charles B. Fisher, 2850 Hill Park Rd., Montreal, Quebec, H3H 1T1, Canada, and Sidney T. Fisher, 53 Morrison Ave., Montreal, Quebec, H3R 1K3, Canada

Filed Apr. 29, 1983, Ser. No. 489,947
Int. Cl.³ H03D *1/00*
U.S. Cl. 329—166 **6 Claims**


RECEIVING AND AMPLIFYING MEANS
DEMODULATOR
BAND-STOP FILTER FOR MODULATED WAVE AND GAIN CONTROL
POLARITY REVERSING MEANS
SIGNAL LESS EXTRANEOUS COMPONENTS TO LOAD
REVERSING CONTROL PULSE GENERATOR

5. Receiving means for deriving a signal from a carrier double sideband amplitude modulated by said signal, with said carrier suppressed to a low amplitude, said signal having no material dc component, which comprises:

means for accepting and amplifying said modulated carrier, automatically controlled in gain by dc voltage from a rectifier and filter receiving said low amplitude carrier;

wherein the improvement over means of the prior art consists of:

a demodulator for said amplified modulated carrier, which produces a wave containing substantially only a low amplitude dc from the low amplitude carrier and the harmonics of said signal but not said signal, and

a filter which removes substantially only said modulated wave from the output of said demodulator, and

a pulse generator receiving the output of said demodulator, for generating control pulses at instants of minimum amplitude of said output which correspond to zero crossings of said signal, and

reversing means which receives said control pulses and reverses the polarity of alternate portions of said filtered demodulator output, between instants at which said pulses successively occur, and

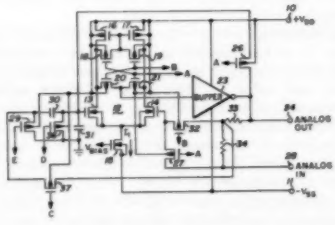
means which delivers to a load said portions, alternately reversed in polarity and freed from extraneous components, as said signal.

4,430,621

CMOS POLARITY SWITCH

James B. Wieser, and Suman H. Patel, both of Sunnyvale, Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed May 21, 1981, Ser. No. 265,876
Int. Cl.³ H03F *3/45*
U.S. Cl. 330—9 **4 Claims**



1. In a polarity switch having a differential amplifier and digital control means for controlling the coupling of an analog signal wherein in one state said differential amplifier is connected as a unity gain voltage follower and in a second state said differential amplifier is connected as a unity gain inverter, the improvement comprising:

means responsive to said digital control means for reversing the sense of said differential amplifier whereby the effect of amplifier offset potential is reduced as a result of switching between said two states;

first and second capacitors;

means responsive to said digital control means for periodically coupling said first capacitor across the input terminals of said differential amplifier to develop a charge equal to the offset potential of said amplifier;

means responsive to said digital control means for connecting said first and second capacitors in parallel whereby the offset potential charge developed across said first capacitor is shared between the two capacitors thereby to develop a fraction of said offset potential; and

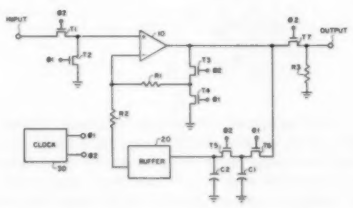
means responsive to said digital control means for connecting said parallel combination of said first and second capacitors to said differential amplifier when connected as a unity gain inverter whereby the offset potential of said amplifier is compensated as a result of said switching.

4,430,622

OFFSET CORRECTION CIRCUIT

Richard M. Simoes, Natick, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Filed Nov. 19, 1981, Ser. No. 322,818
Int. Cl.³ H03F *1/08*
U.S. Cl. 330—9 **1 Claim**



1. An offset correction amplifier consisting of:

an input connection (Input);

an output connection (Output);

a differential amplifier (**10**) having a positive input, a negative input, and an output;

a clock for generating pulses of a first phase and a second phase;

means (**T1, T2**) for coupling the positive input to the input connection only during the second phase;

means (**T7**) for coupling the output to the output connection only during the second phase;

a first feedback loop (**R1**) arranged between the negative input and the output;

means (**T3, T4**) for closing the first feedback loop only during the second phase;

a second feedback loop including a first capacitor (**C1**), a second capacitor (**C2**), and a buffer (**20**) arranged between the output and the negative input, said first capacitor (**C1**) having a capacitance less than the second capacitor (**C2**);

the buffer (**20**) arranged to couple any voltage of the second capacitor (**C2**) to the negative input;

means (**T6**) for coupling the first capacitor to the output only during the first phase; and

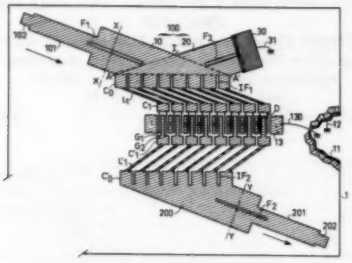
means (**T5**) for coupling the first capacitor (**C1**) to the second capacitor (**C2**) during the second phase.

4,430,623

MONOLITHIC AMPLIFIER COMPRISING A POWER DIVISION AND RECOMBINATION SYSTEM GROUPING A PLURALITY OF TRANSISTORS

Alain Bert, and Didier Kaminsky, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Aug. 31, 1981, Ser. No. 297,965
Claims priority, application France, Sep. 2, 1980, 80 18926
Int. Cl.³ H03F 3/60
U.S. Cl. 330—286 10 Claims



1. A monolithic amplifier of the type having a power division and recombination system grouping a plurality of transistors, said amplifier comprising on a single semi-conductor wafer;

a first bent transmission line having an input branch and a tap branch wherein said tap branch forms a reflection and absorption line leading to a resistive load etched on said wafer;

a plurality of distribution lines said distribution lines having impedance transformation line elements connected at one end in parallel to the bent part of said bent transmission line and on the other end to the inputs of a plurality of parallel-connected transistor amplifiers wherein said impedance transformation line elements are separated from each other by a plurality of variable tilting slots in order to distribute energy; and

a second plurality of impedance transformation lines being connected to the output of said transistor amplifiers and to the input of an output transmission line wherein said input branch, said tap branch and said output transmission line each have a transversal reflections slot made in the longitudinal axis of each of the said tap branch, said input branch and said output transmission line to provide for elimination of traveling waves in the transverse direction, and wherein the angle between said tap branch and said input branch of said bent transmission line is chosen so that reflected waves are in phase in said tap branch.

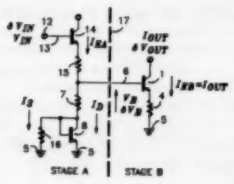
4,430,624

CURRENT MIRROR CIRCUIT ARRANGEMENT

Anthony D. Newton, Geneva, Switzerland, assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 24, 1982, Ser. No. 391,633
Int. Cl.³ H03F 3/10
U.S. Cl. 330—288 7 Claims

1. A current mirror circuit arrangement comprising a transistor having a base electrode, a collector electrode for providing an output current and an emitter electrode coupled to a supply terminal; an input terminal for receiving an input signal voltage; impedance means coupled between the input terminal and the base electrode of the transistor; a series combination of resistive means and a diode coupled between the base electrode of the transistor and a supply terminal; and an impedance connected to share current with the diode such that a combination formed by the diode and the impedance is in series with the resistive means wherein the linearity of the output current-



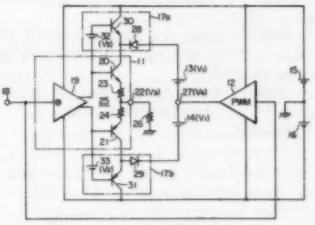
/input signal voltage characteristic may be controlled in dependence upon the magnitude of said impedance.

4,430,625

POWER AMPLIFIER

Kenji Yokoyama, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Jan. 23, 1981, Ser. No. 227,999
Claims priority, application Japan, Jan. 24, 1980, 55-7324
Int. Cl.³ H03F 3/04, 3/38
U.S. Cl. 330—297 12 Claims



1. A power amplifier, comprising:

a first amplifying circuit having amplifying elements for amplifying an input signal in either class-A, class-B or class-AB mode, to drive a load;

a second amplifying circuit using, as an input, a signal corresponding to said input signal for supplying to said amplifying elements an output voltage as a first power supply voltage;

fixed power supplies supplying a second power supply voltage to said second amplifying circuit; and

switching circuits for switching between said first power supply voltage and said second power supply voltage to be delivered to said amplifying elements in accordance with a potential difference between an output voltage of said first amplifying circuit and the output voltage of said second amplifying circuit.

4,430,626

NETWORKS FOR THE LOG DOMAIN

Robert W. Adams, Medford, Mass., assignor to dbx, Inc., Newton, Mass.

Continuation of Ser. No. 97,901, Nov. 28, 1979, abandoned. This application Mar. 8, 1982, Ser. No. 355,712
Int. Cl.³ G06G 7/24; H04B 1/64
U.S. Cl. 331—108 B 9 Claims

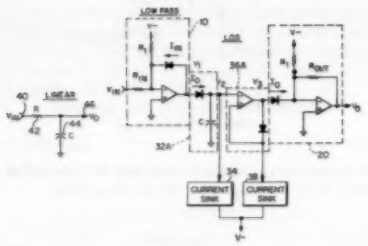
1. A system for processing an input signal and having a variable system frequency response, said system comprising:

signal log converting means responsive to said input signal for providing a first log signal as a function of the logarithm of said input signal;

filter means coupled to said signal log converting means and responsive to said log signal and a control signal for pro-

viding a modified log signal as a function of said first log signal and said control signal; and

signal antilog converting means coupled to said filter means and responsive to said modified log signal for providing an



antilog signal as a function of the antilogarithm of said modified log signal;

wherein said variable system frequency response includes a cut-off frequency as a function of said control signal.

4,430,627

AMPLITUDE CONTROLLED SINE WAVE OSCILLATOR

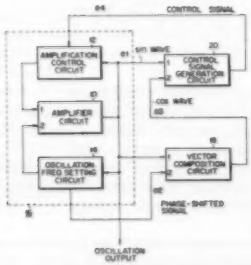
Kenji Machida, 3-3, Nishiogiminami 2, Suginami-ku, Tokyo 167, Japan

PCT No. PCT/JP78/00040, § 371 Date Jun. 3, 1980, § 102(e) Date Jun. 3, 1980, PCT Pub. No. WO80/01224, PCT Pub. Date Jun. 12, 1980

PCT Filed Dec. 5, 1978, Ser. No. 212,086

Int. Cl.³ H03B *5/26*

U.S. Cl. 331—109 **12 Claims**



3. An amplitude controlled sine wave oscillator comprising:

first means (**10**) having first and second feedback loops, for generating an output signal (**e1**);

second means (**12**) provided in said first feedback loop for varying the feedback amount of said first feedback loop;

third means (**14**) provided in said second feedback loop for determining a frequency of said output signal (**e1**) and generating a first signal (**e2**) whose phase is shifted from said output signal (**e1**) by a given amount;

fourth means (**18**) coupled to said first and third means (**10,14**) for composing a second signal (**e3**) from said output signal (**e1**) and said first signal (**e2**), said second signal (**e3**) being phase-shifted from said output signal (**e1**) by a predetermined amount;

fifth means (**20**) coupled to said first and fourth means (**10, 18**) for composing a third signal (**e4***a*) from signals (**e1***a*,−**e1***a*,**e3***a*,−**e3***a*) corresponding to said output signal (**e1**) and said second signal (**e3**), said third signal (**e4***a*) containing higher harmonic frequencies of the oscillation frequency of said output signal and having a DC potential corresponding to the amplitude of said output signal (**e1**); and

sixth means ($C20_1$,$R20_{13}$) coupled to said second and fifth means (**12,20**) for reducing said higher harmonic frequencies of said third signal (**e4***a*) and supplying said second means (**12**) with a control signal (**14**) to vary the feedback amount of said first feedback loop so that the amplitude of said output signal (**e1**) is kept constant.

4,430,628

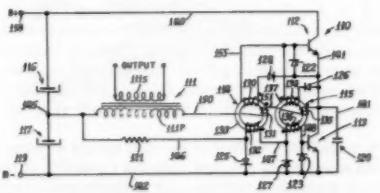
HIGH EFFICIENCY INVERTER AND BALLAST CIRCUITS

Ole K. Nilssen, Caesar Dr., R.R.-5, Barrington, Ill. 60010

Division of Ser. No. 973,741, Dec. 28, 1978, abandoned. This application Dec. 14, 1981, Ser. No. 330,159

Int. Cl.³ H03K *3/282, 3/30*

U.S. Cl. 331—113 A **4 Claims**



1. In a self-oscillating inverter circuit operable to be powered from a source of DC voltage and to provide an AC voltage at an output to a load, said inverter circuit having a pair of switching transistors connected in series across said source of DC voltage, with each of said transistors having a base-emitter junction, the improvement comprising:

a saturable current-transformer connected in circuit with said output, said saturable current-transformer being responsive to the current flowing through said load and operative to provide alternatingly intermittent positive feedback-current to the base-emitter junction of each of said transistors, thereby providing for alternating conduction of said transistors; and

a non-saturable current-transformer connected in circuit with said output, said non-saturable current-transformer being responsive to the current flowing through said load and operative to provide alternatingly intermittent negative feedback-current to the base-emitter junction of each of said transistors, said negative feedback current being provided immediately upon saturation of said saturable current transformer, thereby to aid in the rapid switching off of said transistors.

4,430,629

ELECTRICAL FILTER CIRCUIT OPERATED WITH A DEFINITE SAMPLING AND CLOCK FREQUENCY F_T WHICH CONSISTS OF CTD ELEMENTS

Hermann Betzl; Johann Magerl, both of Munich, and Wilhelm Volejnik, Sauerlach, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Apr. 8, 1981, Ser. No. 252,058

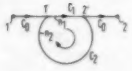
Claims priority, application Fed. Rep. of Germany, Apr. 25, 1980, 3016082

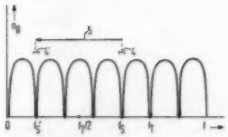
Int. Cl.³ H03H *15/02, 17/06, 7/00*

U.S. Cl. 333—165 **1 Claim**

1. In an electrical filter circuit for use with a frequency translation system, a plurality of CTD lines, each of said lines having a plurality of charge storage cells, a pulse generator operating at a clock frequency f_T for supplying inputs to said storage cells for moving charges therethrough, one of said CTD lines being connected in a closed loop to form a resona-

tor, and means interconnecting said CTD lines to give each of said CTD lines a unidirectional transmission behavior, said clock frequency f_T being selected so that the frequency to be





filtered out by said filter circuit lies between $f_T/2$ and $3f_T/2$, and the frequency to be filtered out is translated to a frequency lying below $f_T/2$.

4,430,630

TUNING CIRCUIT

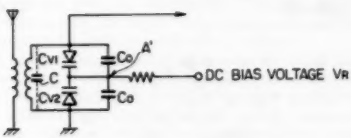
Masaharu Sakamoto, Tokyo, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Nov. 19, 1981, Ser. No. 322,839

Claims priority, application Japan, Nov. 21, 1980, 55-167204[U]

Int. Cl.³ H03J *3/20*

U.S. Cl. 334—15 **2 Claims**



1. A tuning circuit of the type including first and second variable capacitance diodes each of said diodes having first and second terminals said diodes connected in series opposition with their first terminals connected to a common connection point, means for applying a d.c. bias voltage to said common connection point between said diodes, and means for applying a signal across said second terminals of said diodes, the improvement comprising:

a first capacitor connected in parallel between said first and second terminals of said first diode; and

a second capacitor connected in parallel between said first and second terminals of said second diode.

4,430,631

CIRCUIT BREAKER WITH INCREASED CURRENT INTERRUPTING CAPACITY

Kenneth A. Forsell, Brown Deer; William E. Grass, Whitefish Bay; Peter J. Theisen, West Bend, and Michael J. Fajner, Bayside, all of Wis., assignors to Eaton Corporation, Cleveland, Ohio

Filed May 10, 1982, Ser. No. 376,801

Int. Cl.³ H01H *75/00, 77/10, 83/00*

U.S. Cl. 335—16 **15 Claims**

1. An electric circuit breaker comprising, in combination:

an insulating enclosing case;

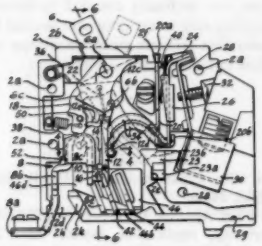
separable contacts disposed within said case;

trip means for causing separation of said contacts in response to overload currents through said contacts;

arc extinguishing means positioned in said case in proximity to said separable contacts;

a contact arm pivoted at an upper end and having spaced legs extending from said pivoted upper end, said legs being joined at the free end of said contact arm; a first one of said separable contacts being secured to a front surface of said contact arm at said free end;

support means positioning a second one of said separable contacts in the arcuate path of travel of said first contact, said support means comprising conductive means extending upwardly from said second contact parallel to said contact arm when said contacts are engaged;



an operating mechanism for selectively causing said pivoted contact arm to move said first contact into and out of engagement with said second contact;

means connected to one of said spaced legs and to said conductive means for causing current to flow in opposite directions therein when said contacts are engaged whereby electromagnetic forces generated by said current flow causes said contact arm to move said first contact out of engagement with said second contact independently of said trip means and said operating mechanism; and

said conductive means being offset laterally with respect to said second contact to substantially align said conductive means with said one leg of said contact arm in the direction of motion of said contact arm.

4,430,632

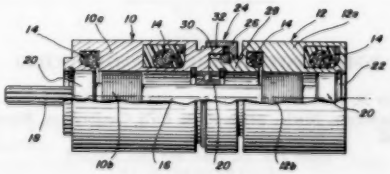
COAXIAL COUPLING AND LOCKING MECHANISM

Richard K. Carlson, Wilmette, Ill., assignor to MPC Products Corporation, Skokie, Ill.

Filed May 26, 1982, Ser. No. 381,950

Int. Cl.³ H01F *21/06*

U.S. Cl. 336—120 **31 Claims**



1. In an axially coupled rotary position-indicating transducer assembly, including a pair of transducers in end-to-end coaxial disposition, coupling means comprising:

a first transducer including a first coil stator assembly;

a second, coaxial transducer including a second coil stator assembly;

a coupling ring carried by said first coil stator assembly for rotation relative thereto;

complementary interengaging coupling means between said

coupling ring and said second coil stator assembly for drawing said assemblies together axially in response to said relative rotation of the coupling ring;

first friction means between said coil stator assemblies for engagement in response to initial rotation of said coupling ring;

second friction means between said coupling ring and said first coil stator assembly; and

said first friction means having a higher coefficient of friction than said second friction means,

whereby said coil stator assemblies can be aligned angularly to align the electrical zeros thereof as said first friction means is drawn into engagement, and said coil stator assemblies can be finally coupled by further rotation of said coupling ring overriding said second friction means while said first friction means maintains the coil stator assemblies in zero electrical alignment.

4,430,633

TIME DELAY FUSE

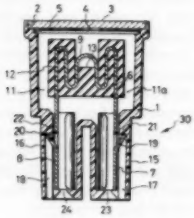
Masashi Ebi, Gifu, Japan, assignor to Pacific Engineering Co., Ltd., Ohgaki, Japan

Filed Apr. 16, 1981, Ser. No. 254,658

Claims priority, application Japan, Apr. 28, 1980, 55-58756[U]; Apr. 28, 1980, 55-58757[U]

Int. Cl.³ H01H *85/10*

U.S. Cl. 337—166 **35 Claims**



1. A fuse comprising:

a plate-like fusible element having two end portions and a fusible portion intermediate the end portions;

terminals provided on the end portions of the element; and

a heat conduction member made of an inorganic material, in which part of the fusible element is embedded, whereby the heat conduction member is in contact with the element and kept apart from the fusible portion.

4,430,634

ROTARY POTENTIOMETER WITH MOLDED TERMINAL PACKAGE

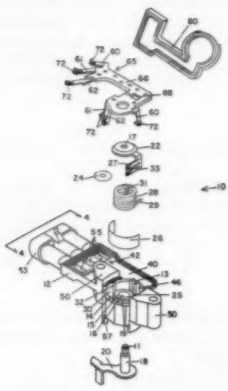
James N. Hufford, Elkhart, Ind., and John Zdanys, Jr., Edwardsburg, Mich., assignors to CTS Corporation, Elkhart, Ind.

Filed Jan. 18, 1982, Ser. No. 340,349

Int. Cl.³ H01C *10/32*

U.S. Cl. 338—164 **18 Claims**

1. In combination, a potentiometer comprising a housing having terminal receiving means and means forming a groove disposed about a post having an aperture therethrough, a shaft journalled in said aperture and having actuation means attached thereto, resilient means operatively secured to the shaft, resistive element means disposed within said groove, drive arm means secured to said shaft, contactor means fixedly secured to said drive arm means and positioned for wipable engagement with said resistive element means, and a terminal coupling subassembly comprising a plurality of terminals secured together in an integral subassembly fittable within said terminal



receiving means and for connecting said potentiometer with external circuit means.

4,430,635

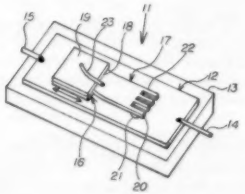
VARIABLE RESISTANCE DEVICE

Peter J. Sacchetti, Manchester, N.H., assignor to New England Instrument Company, Natick, Mass.

Filed Aug. 17, 1981, Ser. No. 293,450

Int. Cl.³ H01C *10/38*

U.S. Cl. 338—176 **11 Claims**



1. An electrical device comprising:

a non-conductive base;

an electrically conductive means supported by said base and forming a track surface;

electrical terminal means connected to said electrically conductive means; and

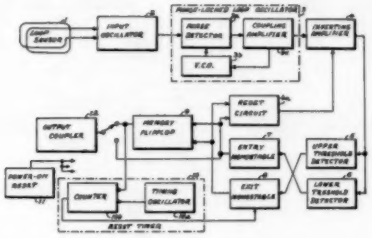
a wiper assembly mounted for movement relative to said electrically conductive means and comprising a carrier means, an elongated conductive spring member having one end secured to said carrier means, a conductive coupling element bonded to an end of said spring member opposite to said one end, and a corrosion resistant contact means thermocompression bonded to said coupling element and disposed to ride along said track surface during said movement of said wiper assembly relative thereto and wherein said coupling element is formed from a material different than the materials forming either said spring member or said contact means, said spring member being formed from a material having a minimum modulus of elasticity of 28×10^6 psi and a resistivity between 40–100 microohm centimeters, said contact means being formed from a noble metal alloy having a minimum Knoop hardness of 300, and said coupling element being formed from a material substantially less hard than said material forming said contact means.

4,430,636

LOOP DETECTOR FOR TRAFFIC SIGNAL CONTROL

Robert L. Bruce, 10513 Medoc Ct., San Diego, Calif. 92131

Filed Jun. 29, 1981, Ser. No. 278,766
Int. Cl.[3] G08G 1/07
U.S. Cl. 340—941 7 Claims



1. A traffic signal control apparatus, for detecting changes in the frequency of a loop-sensor oscillator, comprising a phase-locked loop including a voltage-controlled oscillator and a phase detector generating an output voltage proportional to the phase difference between the output of the loop-sensor oscillator and the output of the voltage-controlled oscillator, and which further comprises: an attenuating and phase compensation network coupling the output of the phase detector to the control voltage input of the voltage-controlled oscillator, said network being adjusted to severely restrict the tuning range of the voltage-controlled oscillator to cover no more than the maximum expected frequency change excursions of the loop-sensor oscillator in order to obtain the maximum output voltage from the phase-locked loop for a given phase difference between the output of the loop-sensor oscillator and the output of the voltage-controlled oscillator.

4. A traffic signal control apparatus for detecting changes in the frequency of a loop-sensor oscillator, comprising a phase-locked loop including a voltage-controlled oscillator and a phase detector generating an output voltage proportional to the phase difference between the output of the loop-sensor oscillator and the output of the voltage-controlled oscillator, and which further comprises:

an attenuating network coupling the output of the phase detector to the contol voltage input of the voltage-controlled oscillator;

an amplifier coupled to the attenuating network;

at least two threshold detectors connected to the output of the amplifier;

one of said detectors being adjusted to generate an entry triggering signal whenever the frequency shift of the loop-sensor oscillator corresponds to a sudden increase in the loop sensor inductance;

another of said detectors being adjusted to generate a exit triggering signal whenever the frequency shift of the loop sensor oscillator corresponds to a sudden decrease of the loop-sensor inductance.

4,430,637

AUTOMOTIVE TRAILER CONNECTION RECOGNITION SYSTEM

Heinz-Jürgen Koch-Dücker, Edingen-Neckarhausen; Erich Junginger, Stuttgart, and Eberhard Schnaibel, Hemmingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Aug. 25, 1981, Ser. No. 296,111
Claims priority, application Fed. Rep. of Germany, Oct. 11, 1980, 3038464
Int. Cl.[3] B60Q 1/00
U.S. Cl. 340—52 R 16 Claims

1. Automotive trailer connection recognition system for use with a tractor electrical system comprising:

power supply buses (1, Ch);

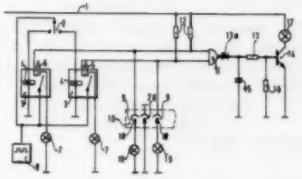
a blinker system on the tractor including means (8) generating blinker pulses;

at least two tractor blinker lamps (7) of a first predetermined resistance on the tractor;

a blinker switch (2, 3, 3′, 3″, 3‴) selectively controlling connection of at least one of the blinker lamps (7) to the blinker pulse generator means (8);

a severable trailer connector (10);

at least two trailer blinker lamps (19, 19a) of a second predetermined resistance connected to the trailer connector (10:



connection means (9′) connecting the blinker switch means to the trailer connector (10) for severable connection to the trailer blinker lamps;

resistance sensing means (11, 12) connected to said connection means (9′) including logic means (11) recognizing a high-resistance or low-resistance condition on said connection means (9′) and providing an outtput signal if the resistance sensing means senses a connected low-resistance condition on said connection means;

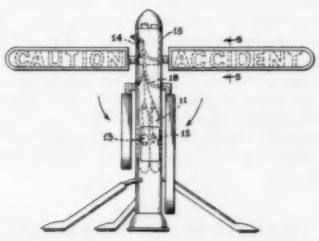
and mean (5, 6; 22, 23, 24) for isolating the at least two tractor blinker lamps (7) on the tractor from said connection means (9′) unless said lamps are energized from said power supply buses (1, Ch).

4,430,638

AUTOMOBILE SAFETY LIGHT

Norman A. Parker, 10 W. Logan St., Philadelphia, Pa. 19144

Filed Dec. 15, 1981, Ser. No. 330,967
Int. Cl.[3] G08B 5/00; B60Q 1/00
U.S. Cl. 340—139 5 Claims



1. A warning and distress signal device for a disabled vehicle comprising

a cylindrical support body having an upper end portion and a lower end portion with a battery compartment in the upper end portion where a battery is secured therein by a capping means and a means for temporarily securing said device to a surface on the vehicle at the lower end portion,

a plurality of illuminating word light arms wherein each word light arm is comprised of individually shaped letters held together by a border and is pivotally, hingedly connected to the upper end portion but below the battery compartment of the upper end portion of the cylindrical support body, said word light arms being able to move between a vertical position parallel to the cylindrical

support body and an exposed position extending perpendicularly from the cylindrical support body,

means for energizing the arms for illuminating the words and borders in bright safety colors,

means for disconnecting the arms from the energizing means of the device when the arms are folded down to the position parallel to the cylindrical support body, and

each of the illuminating word light arms expressing a driver's distress message in bright safety colors.

4,430,639

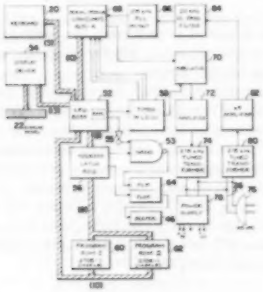
VISUAL MESSAGE INTERCOMMUNICATION UNIT AND SYSTEM

Dale L. Bennett, Lafayette, Calif.; Robert J. Grady, Hunsville, Ark.; James L. Konsevich, San Jose, Calif.; Perry H. Vartanian, Woodside, Calif., assignors to Benvar Associates, c/o Dale Bennett, New York, N.Y.

Filed May 21, 1981, Ser. No. 265,773

Int. Cl.³ H04B *3/54*

U.S. Cl. 340—310 A **18 Claims**



1. For use in a visual message intercommunication system, a message terminal unit, said unit comprising:

(a) a keyboard comprising a plurality of data entry keys and visible message display means,

(b) display control means for causing data entered on said keyboard to be displayed on said display means,

(c) transmitting means for causing data entered on said keyboard and displayed on said display means to be transmitted upon user command to an output of said unit,

(d) receiving means for automatically storing and displaying a message received from another unit and for transmitting an automatic response messsage to an output of said unit upon receipt of such message, and

(e) means for alerting a user in response to any reception of an incoming automatic response message from another unit.

4,430,640

STEP DATA TO SYNCHRO CONVERTER

James E. Hermansdorfer, and William T. Spurgin, both of Charlottesville, Va., assignors to Sperry Corporation, New York, N.Y.

Filed Jan. 29, 1981, Ser. No. 229,478

Int. Cl.³ H03K *13/00*

U.S. Cl. 340—347 SY **3 Claims**

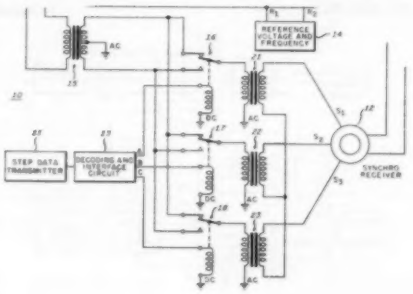
1. A step data-to-synchro converter adapted to receive data signals from a step data transmitter in a three bit binary step data format, and provide therefrom analog signals to a synchro receiver, comprising:

a reference signal source having a selected frequency;

a reference transformer, coupled to said reference signal source, for providing in-phase and out-of-phase a.c. signals having a fixed amplitude;

switching means, coupled to said reference transformer and responsive to said data signals from said step data transmitter, for selecting combinations of said in-phase and out-of-phase a.c. signals; and

a plurality of output transformers, for providing analog data signals to drive said synchro receiver, each of said output



transformers coupled to a corresponding output terminal of said switching means, and each having terminal means for coupling to a corresponding input terminal of said synchro receiver.

4,430,641

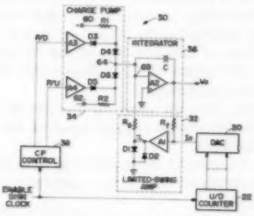
CHARGE-PUMP GLITCH FILTER

Bruce K. Baur, Milwaukie, and John R. Ollis, Canby, both of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed May 11, 1981, Ser. No. 262,718

Int. Cl.³ H03K *13/02, 5/08;* H03H *11/12;* H04B *15/00*

U.S. Cl. 340—347 DA **10 Claims**



7. A circuit responsive to a digital input signal defining a series of unit changes in a digital value for filtering undesirable aberrations from an analog signal produced by a digital-to-analog converter also responsive to said digital input signal, said circuit comprising:

(a) a slew-rate filter responsive to said analog signal produced by said digital-to-analog convertor, and having a slew-rate substantially less than the maximum rate of unit changes in said digital value, for integrating each change in said analog signal over several periods of said digital input signal, and for producing a second analog signal representative of said integrating change;

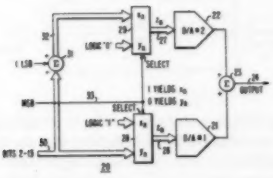
(b) means responsive to said digital input signal for producing a third analog signal representative of the direction and timing of each change in said digital value; and

(c) means within said slew-rate filter for impressing said third analog signal onto said second analog signal to produce an analog output signal representative of the instantaneous sum of the integrating changes in said analog signal and the direction and timing of the unit changes in said digital value.

4,430,642
DIGITAL-TO-ANALOG CONVERTER

Benjamin F. Weigand, Cantonsville, and John W. Frech, Baltimore, both of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 2, 1981, Ser. No. 308,010
Int. Cl.³ H03K *13/02*
U.S. Cl. 340—347 DA **3 Claims**



1. Apparatus for converting binary coded digital input signals having most significant and least significant bits into corresponding analog signals, comprising:

at least a pair of digital to analog converters, each said converter being effective when activated to receive at its respective input a digital signal and generate at its output a corresponding analog signal;

means combining the output of each converter to provide a common analog output;

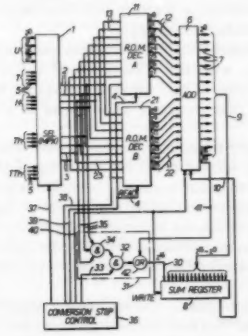
means to apply the digital input signal to at least both said converters, including means modifying the digital input signal to one of said converters to generate an offset of at least one significant bit from the input to another of said converters; and

means to apply the digital input signal selectively to one of said converters in accordance with the binary state of a more significant bit of the input signal to obtain the analog signal of the common analog output from the selected converter whereby switching errors are reduced at times when the more significant bits change their respective binary state.

4,430,643
BINARY-CODED-DECIMAL TO BINARY CONVERTER

Ernesto G. Sevilla, Herkimer, N.Y., assignor to International Computers Limited, London, England

Continuation of Ser. No. 171,972, Jul. 24, 1980, abandoned. This application Jul. 22, 1982, Ser. No. 400,849
Int. Cl.³ G06F *5/02*
U.S. Cl. 340—347 DD **4 Claims**



1. Binary-coded-decimal to binary conversion apparatus for converting a multidigit binary-coded-decimal number to its pure binary equivalent comprising:

two similar memories each having eight address lines and a further address line, corresponding address lines of the two memories being connected in common, first and second groups of storage locations, locations of the first group being addressable by address signals on said eight address lines in combination with a first signal on said further address line and locations of the second group being addressable by address signals on said eight address lines in combination with a second signal on said further address line, and a plurality of output lines;

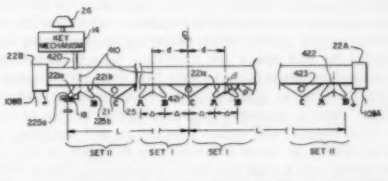
control means operative in one step to generate said first signal and a first control signal and operative in a further step to generate said second signal and a second control signal; input means connected to said eight address lines operative in response to the first control signal in said one step to apply binary-code components of a first binary-coded-decimal digit to four of said eight address lines and binary-code components of a second binary-coded-decimal digit to the remainder of said eight address lines to address one location of the first group in each of the memories and thereby read out a pure binary equivalent of said first and second digits stored in said addressed location onto the output lines and operative in response to the second control signal in said further step to apply binary-code components of a third binary-coded-decimal digit to said four of said eight address lines and binary-code components of a fourth binary-coded-decimal digit to said remainder of said eight address lines to address one location of the second group in each of the memories and thereby read out a pure binary equivalent of said third and fourth digits stored in said addressed location onto the output lines;

and means connected to said output lines operative to sum the pure binary equivalent of said first and second digits and the pure binary equivalent of said third and fourth digits.

4,430,644
ENCODING APPARATUS HAVING AN ACOUSTIC MEMBER WITH MIRROR-IMAGE TABS

Raymond A. Blanchard, Jr., Freeville, N.Y., and Kenneth E. Garey, San Jose, Calif., assignors to SCM Corporation, New York, N.Y.

Filed Nov. 2, 1981, Ser. No. 317,038
Int. Cl.³ G06F *3/02*; H04L *15/03*
U.S. Cl. 340—365 R **19 Claims**



1. In an encoding apparatus of the acoustic type comprising an acoustic member of the kind having diverging wave fronts traveling within the member upon selective activation of any one of a plurality of tabs on the member, the wave fronts being of the same or different polarity; transducers operatively connected to the member for sensing the diverging wave fronts and producing signals with an elapsed time therebetween, the improvement wherein said plurality of tabs are arranged in sets comprising a non-polarizing tab producing wave fronts of the same polarity and at least one polarizing tab producing wave fronts of different polarity, said sets of tabs being disposed along the member in mirror-image pairs with respect to the midpoint of the member; time-responsive units connected to the transducers for generating from the elapsed time a discrete output signal for each said mirror-image pair of tab sets, together with first means connected to the transducers and responsive to the polarity of each wave front for providing a first

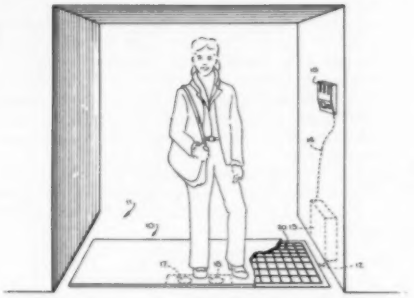
signal on sensing wave fronts indicative of an impact against said non-polarizing tab of a set and a second signal on sensing wave fronts indicative of an impact against said polarizing tab of the set; means connected to the transducers and responsive to the relative sequence of said sensed wave fronts for producing a third signal indicating the side of said member on which a wave front is first sensed, and code-generating means producing a unique code identifying the particular tab inducing said acoustic energy, said code-generating means being responsive to said discrete output signal and one of said first and second signals in conjunction with said third signal.

4,430,645

SURVEILLANCE SYSTEM EMPLOYING A DUAL FUNCTION FLOOR MAT RADIATOR

Ezra D. Eskandry, Pompano Beach, and Jon N. Weaver, Boca Raton, both of Fla., assignors to Sensormatic Electronics Corporation, Deerfield Beach, Fla.

Filed Apr. 7, 1981, Ser. No. 251,933
Int. Cl.³ G08B *13/24*
U.S. Cl. 340—572 **15 Claims**



1. A surveillance system for detecting the presence in a controlled space of a miniature electromagnetic wave receptor-reradiator with signal mixing capability, comprising in combination means for propagating through said space an electromagnetic microwave signal, a source of low frequency signals, an electrode coupled to said source of low frequency signals and disposed in a capacitor structure constructed and arranged for disposition in said space along the path of travel of said receptor-reradiator through said space for direct capacitive coupling to said receptor-reradiator whenever the latter is present in said space, signal detecting means arranged to be coupled to said space for receiving signals therefrom and detecting signals related to said low frequency signals only when received as modulation on a carrier signal whose frequency bears a predetermined relationship to that of said microwave signals, and means coupled to said detecting means for providing an alarm responsive to detection of said signals that are related to said low frequency signals, characterized in that said means for propagating a microwave signal through said space comprises a microstrip antenna with a signal feed constructed and arranged to propagate said signal through said space, said microstrip antenna being disposed in association with said capacitor structure in a common structure.

4,430,646

FORWARD SCATTER SMOKE DETECTOR

Robert B. Enemark, Duxbury, Mass., assignor to American District Telegraph Company, Jersey City, N.J.

Filed Dec. 31, 1980, Ser. No. 221,524
Int. Cl.³ G08B *17/10*
U.S. Cl. 340—630 **5 Claims**

1. A particle detector comprising:
- a source of light directed on a first path accessible to particles;
- a photocell having a photosensitive area viewing on a second path into a zone of intersection of the two paths and responsive to light scattered from particles in the zone; and
- a body masking direct light from the source to the photosensitive area and having a periphery outside which light passes to the intersection zone;

wherein the detector includes a reflective surface disposed between the masking body periphery and the light source having reflective components at an angle relative to direct rays from the source toward the masking body such as to direct such rays away from the body into a substantial value of the intersection zone; and

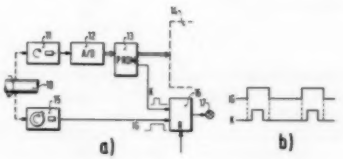
wherein the reflective surface is cone like.

4,430,647

MONITOR FOR DETECTING MALFUNCTION OF A ROTATION-ANGLE TRANSDUCER

Heinz Möller, Stuttgart, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 21, 1981, Ser. No. 265,959
Claims priority, application Fed. Rep. of Germany, Jul. 4, 1980, 3025379
Int. Cl.³ G08B *21/00*
U.S. Cl. 340—679 **8 Claims**

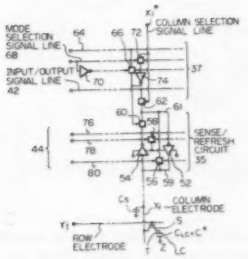


1. Apparatus for monitoring the output signal of a first rotation transducer driven by a rotary part of a Diesel engine for timing fuel injection, comprising:
- means for generating a first recurrent pulse signal (K) in synchronism with the occurrence of a first particular angular position of said rotation transducer and for providing said first recurrent pulse signal at a first signal output;
- a supplementary transducer driven by said rotary part for producing a second recurrent pulse signal (IG) in synchronism with occurrence of a particular angular position of said rotary part relative to a reference mark and for providing said second recurrent pulse signal at a second signal output, said second recurrent pulse signal being of a duration which is different from that of said first recurrent pulse signal;
- time comparison means, having inputs respectively connected to said first and second signal outputs, for producing an output when the shorter of said first and second pulse signals is present during the absence of the longer of them, and
- first alarm means responsive to said output of said time comparison means.

4,430,648
COMBINATION MATRIX ARRAY DISPLAY AND MEMORY SYSTEM

Seigo Togashi, and Akira Tsuzuki, both of Tokorozawa, Japan, assignors to Citizen Watch Company Limited, Tokyo, Japan

Filed Jan. 12, 1981, Ser. No. 224,600
Claims priority, application Japan, Jan. 22, 1980, 55-006479
Int. Cl.³ G09G 3/00
U.S. Cl. 340—718 4 Claims



1. A matrix array display and memory system, comprising:

a display panel comprising a set of row electrodes and a set of column electrodes, a plurality of switching elements each disposed at a respective intersection of said row and column electrodes and being coupled to one of said row electrodes and responsive to signals applied to said one of the row electrodes for selective switching to a conductive and a non-conductive state, and a plurality of display elements each coupled through a corresponding one of said switching elements to one of said column electrodes, each of said display elements having a predetermined amount of capacitance and being selectively settable to a first display state in which said capacitance is in a charged condition and a second display state in which said capacitance is in a discharged condition;

row drive circuit means coupled to said row electrodes for generating row drive signals to successively set rows of said switching elements into the conductive state during periodically repeated sense/refresh intervals, to thereby successively and periodically couple rows of said display elements to said column electrodes;

distribution circuit means coupled to said column electrodes for applying signals representing digital data thereto, for thereby selectively charging the capacitances of said display elements coupled to said column electrodes, to thereby simultaneously display and memorize said digital data by said display elements;

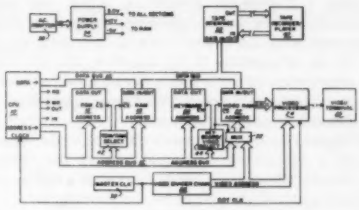
a plurality of sense/refresh circuits each coupled to a corresponding one of said column electrodes, each of said sense/refresh circuits acting during each of said sense/refresh intervals to first sense a potential appearing upon the corresponding column electrode representing the charge condition of one of said display elements, to then produce an output potential in accordance with said sensed potential, and to thereby drive said one of the display elements to said output potential;

said sense/refresh circuits thereby acting during said sense/refresh intervals to periodically refresh said digital data memorized in said display elements.

4,430,649
VIDEO PROCESSING SYSTEM

Steven Leininger, Arlington, Tex., assignor to Radio Shack, Forth Worth, Tex.

Continuation of Ser. No. 926,957, Jul. 21, 1978. This application May 8, 1981, Ser. No. 261,976
Int. Cl.³ G09G 1/16
U.S. Cl. 340—731 13 Claims



1. Video processing logic for providing a video serial signal to a receiver in accordance with an alternate mode control to provide different width characters to be displayed by the receiver, comprising;

memory means for storing a plurality of character codes,

storage means coupled from the memory means for holding a character code at a time transferred from the memory means,

a video divider chain comprising a plurality of successively coupled counters and including means defining a character line code,

character generator means receiving said character code and said character line code for providing line dot signals representative of a portion of the character,

parallel-to-serial shift means coupled from said character generator means receiving the line dot signals in parallel and including a clock input for providing a serial video signal,

and control means for controlling said parallel-to-serial shift means to provide at least two different video rate signals representative of different width characters to be displayed by the receiver,

said control means comprising,

means for establishing a mode control signal having alternate states for indicating different width characters,

clock means for providing a first frequency signal,

divider means coupled from said clock means for providing a second frequency signal lower in frequency than said first frequency signal,

and logic circuit means responsive to said first and second frequency signals and said mode control signal for providing a shift control signal coupling to the parallel-to-serial means and in one state of the mode control signal coupling the first frequency signal and in another state of the mode control signal coupling the second frequency signal,

said logic circuit means also having means for providing an input signal to said video divider chain that is maintained at the same constant frequency during either of the states established by said means for establishing a mode control signal having alternate states.

4,430,650

DISPLAY PROCESS USING A THERMO-OPTICAL EFFECT WITH A MEMORY IN A THIN DISC-LIKE LIQUID CRYSTAL LAYER AND DISC-LIKE LIQUID CRYSTALS HAVING SUCH AN EFFECT

Jean Billard; Jean-Claude Dubois; Michel Hareng; Serge Le Berre, and Jean-Noël Perbet, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Aug. 31, 1981, Ser. No. 298,185
Claims priority, application France, Sep. 2, 1980, 80 18924
Int. Cl.³ C09K 3/34; G02F 1/133, 1/137; G09F 9/35
U.S. Cl. 340—784 6 Claims

1. A display process having information memory using a cell which comprises a liquid crystal layer uniformly oriented between 2 transparent supporting plates, said cell being scanned by an inscription light beam, the process comprising:

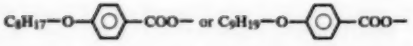
(a) modulating the intensity of said light beam as a function of the information to be inscribed, thereby raising the temperature of some points of said liquid crystal layer so as to change said liquid crystal layer points from an initial phase to a second phase, and

(b) rapidly cooling said points changed to the second phase to a temperature corresponding to the initial phase, thereby causing said points to exist in a diffuse state,

wherein said liquid crystal has the formula (I):

(I)

wherein R is



and wherein said initial phase is a D_B mesophase having a mosaic texture and said second phase is a D_F disk-like mesophase or isotropic phase.

3. A display process having information memory using a cell which comprises a liquid crystal layer uniformly oriented between 2 transparent supporting plates, each plate being covered on its internal face with at least one transparent electrode, said cell being scanned by an inscription light beam and being subjected to voltage pulses applied by said electrodes, the process comprising:

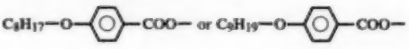
(a) scanning different points of said cell with a light beam of constant intensity, thereby raising the temperature of said points so as to change said points from an initial phase to a second phase, and

(b) rapidly cooling said points changed to the second phase to a temperature corresponding to the initial phase, said voltage pulses being applied during cooling,

wherein said liquid crystal has the formula (I)

(I)

wherein R is



and wherein said initial phase is a D_B mesophase having a mosaic texture and said second phase is a D_F disk-like mesophase or isotropic phase.

6. A display process having information memory using a cell which comprises a liquid crystal layer uniformly oriented between 2 transparent supporting plates, each plate being covered on its internal face with two sets of electrodes forming a matrix system of lines and columns, the electrodes of one set being selectively heated, the two sets cooperating in order to apply voltage pulses to the layer as a function of the information to be inscribed, the process comprising:

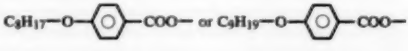
(a) heating the points of the liquid crystal layer, by means of a heating electrode, thereby raising the temperature of said points so as to change said points from an initial phase to a second phase, and

(b) cooling said points changed to the second phase to a temperature corresponding to the initial phase, said voltage pulses being applied during cooling,

wherein said liquid crystal has the formula (I)

(I)

wherein R is



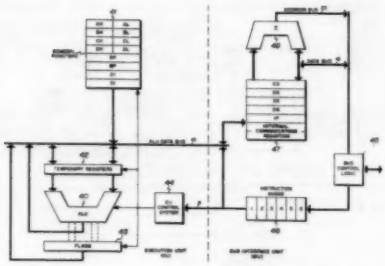
and wherein said initial phase is an inclined disk-like phase and said second phase is a D_F disk-like mesophase or isotropic phase.

4,430,651

EXPANDABLE AND CONTRACTIBLE LOCAL AREA NETWORK SYSTEM

David M. Bryant, Cardiff, Calif.; Ryn C. Corbeil, Bridgewater, N.J.; Michael A. Malcolm, Waterloo, Canada; Lawrence D. Rogers, Del Mar, and Donald R. Thompson, San Diego, both of Calif., assignors to Burroughs Corporation, Detroit, Mich.

Filed Aug. 27, 1981, Ser. No. 296,952
Int. Cl.³ H04Q 9/00
U.S. Cl. 340—825.52 10 Claims



1. A station in a communications network including a communications channel for the transmission of packets of information, and a plurality of stations coupled to said channel, said a station comprising:

address selection means for randomly selecting a potential address from a range of permissible addresses;

transmitting means for transmitting an information packet to said selected address so as to test said communications network for possible existence of another station having said selected address; and

receiving means for receiving an acknowledgment from said another station;

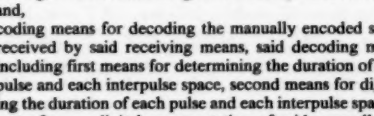
said address selection means being adapted to randomly select a new potential address if said another station acknowledges receipt of said information packet.

4,430,652

REMOTE CONTROL SYSTEM

Dan E. Rothenbuhler, Acme, and Galen A. Biery, Jr., Bellingham, both of Wash., assignors to Rothenbuhler Engineering Co., Sedro-Woolley, Wash.

Filed Nov. 25, 1981, Ser. No. 325,016
Int. Cl.³ G08C 19/00
U.S. Cl. 340—825.69 20 Claims



1. A remote control system comprising:

transmitting means for transmitting a manually encoded signal consisting of a sequence of pulses and interpulse spaces;

receiving means for receiving said manually encoded signal; and,

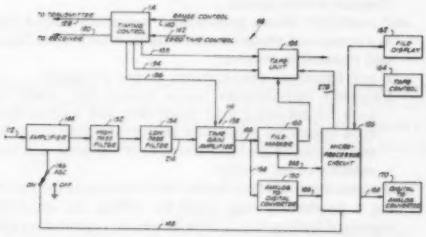
decoding means for decoding the manually encoded signal received by said receiving means, said decoding means including first means for determining the duration of each pulse and each interpulse space, second means for digitizing the duration of each pulse and each interpulse space so as to form a digital representation of said manually encoded signal, third means for correlating said digital representation with a plurality of reference digital representations each corresponding to one of a plurality of predetermined output control signals and for selecting one of said output control signals upon determination of a match between said digital representation and one of said plurality of reference digital representations, and, fourth means for supplying said selected output control signal to a controlled device.

4,430,653

EARTH PROBING RADAR SYSTEM

Julian B. Coon, and Charles J. Schafers, both of Ponca City, Okla., assignors to Conoco Inc., Ponca City, Okla.

Continuation-in-part of Ser. No. 90,584, Nov. 2, 1979, abandoned. This application Dec. 19, 1980, Ser. No. 218,437
Int. Cl.³ G02S 13/04
U.S. Cl. 343—5 NA 30 Claims



1. A method for determining condition and homogeneity of the structure of coal seams, comprising:

transmitting pulsed electromagnetic energy into the face of a coal seam;

receiving said energy transmitted into said face to develop a return signal per transmitted pulse;

processing selected successive return signals to eliminate source coherent interference while increasing the signal to noise ratio; and

indicating visually any structural inhomogeneities within said coal seam.

4,430,654

METHOD AND APPARATUS FOR SUPPRESSING CLUTTER

Hanspeter Küpfer, Uitikon, Switzerland, assignor to Siemens-Albis Aktiengesellschaft, Zurich, Switzerland

Continuation of Ser. No. 112,197, Jan. 15, 1980, abandoned. This application Jun. 28, 1982, Ser. No. 392,624
Claims priority, application Switzerland, Feb. 5, 1979, 1093/79
Int. Cl.³ G01S 13/00
U.S. Cl. 343—5 NQ 3 Claims

1. Apparatus for suppressing Doppler clutter signals arising apart from the flying-target Doppler signal as further Doppler signals in a pulse-Dippler-tracking radar system including a transmitter-receiver, an evaluation device and a clutter compensation device and containing a quadrature and inphase channels, the improvement which comprises:

said transmitter-receiver comprising means for generating a phase reference signal derived from its transmitted signal;

said transmitter-receiver further comprising means for generating a quadrature-difference siganl by subtracting the quadrature signals of both of the volume halves of a quadrature channel;

said transmitter-receiver further comprising means for generating an inphase-difference signal by subtracting the inphase-signals of both halves of an inphase-channel;

said clutter compensation device being connected to said transmitter-receiver to receive said phase reference signal and said quadrature and inphase difference signals;

said clutter compensation device comprising null frequency discriminator and modulator means;

said modulator means receiving via a signal input said phase reference signal from said transmitter-receiver and via a control input an output signal from said frequency discriminator means, which output signal has a direct-current voltage portion representative of the frequency of the Doppler clutter signal;

said modulator means generating a modulator output signal as a connected phase reference signal which is fed back to said transmitter-receiver;

said null frequency discriminator means comprises:

frequency discriminator means having two inputs, one each for receiving said quadrature and inphase-difference signals for generating an output signal whose sign and amplitude are representative of the sense and radial velocity of the clutter;

said transmitter-receiver further includes means for generating a guadrature sum signal by adding the quadrature signals of both of the volume halves of a quadrature channel;

said transmitter-receiver further comprises means for generating an inphase sum signal by adding the inphase signals of both halves of an inphase-channel,

said evaluation device receives said quadrature-sum and difference and inphase-sum and difference signals and generates an error voltage signal therefrom;

said clutter compensation device further includes means for adding a weighted quadrature signal to said quadrature-difference signal, the resulting addition signal being fed to the quadrature signal input of said frequency discriminator means;

said clutter compensation device further includes means for adding a weighted inphase signal to said inphase-difference signal, the resulting addition signal being fed to the inphase signal input of said frequency discriminator means;

the weighted quadrature signal constitutes a weighted part of said quadrature-sum signal and the weighted inphase signal constitutes a weighted part of said inphase-sum signal; and

the weighting of these signals is formed by a function of the target eccentricity, via said error voltage signal.

4,430,655

RADAR TARGET ANGLE MEASURING SYSTEM

Otto E. Rittenbach, 17 Jumping Brook Dr., Neptune, N.J. 07753

Continuation of Ser. No. 159,539, Jun. 16, 1979, abandoned. This application Dec. 6, 1982, Ser. No. 446,922

Int. Cl.³ G01S *13/00, 7/28*

U.S. Cl. 343—16 LS **1 Claim**

1. A radar system for measuring the angle of a target comprising:

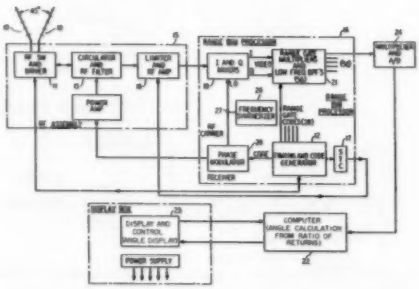
radar antenna means for producing at any instant one of a pair of directional radar beams, said beams angularly displaced with respect to each other and overlapping each other within the expected target direction;

radio frequency pulse means for generating and transmitting to said radar antenna means a train of radio frequency pulses to form a target acquisition cycle;

antenna beam switching means connected between said radar antenna means and said pulse means for switching, over a common time period, a first series of pulses extracted from said train of pulses to one of said radar beams and a second series of pulses extracted from said train of pulses to the other of said radar beams;

said first series of pulses being formed from every other pulse in said train of pulses and said second series of pulses being formed from the other of said pulses in said train of pulses;

said first series of pulses forming a first code and said second series of pulses forming a second code that differs from said first code;



radio frequency signal receiver means connected to said antenna means for receiving signals received by said antenna means during a predetermined time slot corresponding to a given range interval;

means for correlating signals received by said radio frequency receiver means with signals corresponding to said first and second codes to form first and second correlation outputs; and

means for determining the ratio of energy in said first and second correlation outputs to obtain to target angle.

4,430,656

METHOD FOR REDUCING PRINT DISTORTION OF INK DROP WRITING APPARATUS

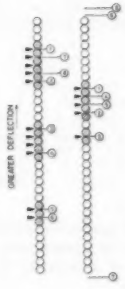
Takahiro Yamada, Tohkai, and Tadashi Kuwabara, Hitachi, both of Japan, assignors to Hitachi, Ltd.

Filed Dec. 18, 1981, Ser. No. 332,248

Claims priority, application Japan, Dec. 19, 1980, 55-178977

Int. Cl.³ G01D *9/00*

U.S. Cl. 346—1.1 **13 Claims**



1. In a method for writing information on a writing medium with ink drops which are sequentially generated, selectively charged in accordance with the information, and directed toward the writing medium so as to impinge thereon in column form for representing the information as a continuing mark formed by a sequence of charged ink drops, the improvement

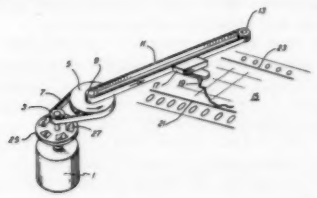
comprising the steps of utilizing a predetermined number of uncharged dummy drops for each column, and inserting a single uncharged dummy drop only at selected locations and in a predetermined order with respect to the drop positions for eliminating merging of adjacent charged ink drops when an uncharged dummy drop is inserted therebetween, the step of inserting including the steps of initialing determining an insertion location for inserting an uncharged dummy drop between the first and last two adjacent charged ink drops, respectively, of each sequence of charged ink drops along the column, and controlling the selective charging of the sequentially generated ink drops so as to insert the uncharged dummy drops at the determined locations of the column.

4,430,657

PEN DRIVE FOR RECORDER

Larkin Scott, Forth Worth, Tex., and William C. Muellner, LaGrange Park, Ill., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Mar. 3, 1982, Ser. No. 354,405
Int. Cl.³ G01D *15/24, 3/06*
U.S. Cl. 346—32 **8 Claims**



1. A recorder pen drive comprising, in combination:
a reversible motor,
mechanical positioning means driven by said motor,
encoder means driven by said motor,
sensor means disposed to generate alternate transition signals during the motion of said encoder means,
a microprocessor with peripheral interface adaptor means connected to receive said transition signals and to apply said transition signals as interrupt requests to said microprocessor,
said microprocessor being operative to effect an encoder service routine initiated by said interrupt requests, to determine the direction of movement of said encoder means and to increment or decrement an output count according to said direction,
said microprocessor being operative to effect a servo routine to control the direction and speed of rotation of said motor, said control being determined by computing the difference between said output count and an input proportional to the signal input applied to the recorder, said input being compared to a software stop count equivalent to that of a predetermined software stop position and, if said input exceeds said software stop count, said software stop count is substituted for said input in said servo routine, and
means responsive to said servo routine to drive said motor.

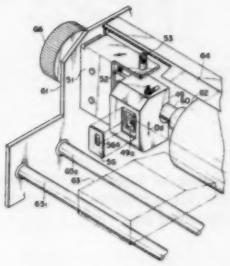
4,430,658

APPARATUS FOR DETECTING DEFLECTION OF A CHARGED INK DROPLET.

Takao Fukazawa, Tokyo, and Chuji Ishikawa, Kawasaki, both of Japan, assignors to Ricoh Company, Ltd., Japan

Filed Jun. 1, 1982, Ser. No. 384,060
Claims priority, application Japan, Jun. 1, 1981, 56-84183
Int. Cl.³ G01D *18/00*
U.S. Cl. 346—75 **5 Claims**

1. Apparatus for detecting deflection of a charged ink droplet comprising:
a housing provided with a window for the passage of said charged ink droplet therethrough;
electrode means disposed inside the chamber defined by said housing for detecting the charge of said charged ink droplet;
support means for supporting said housing;



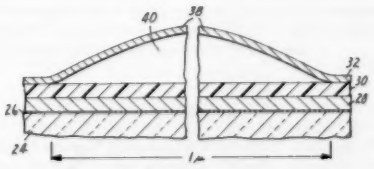
biasing means for normally biasing said housing generally in the direction of deflection of said charged ink droplet; and
adjusting means for adjustably restraining the movement of said housing against the force applied by said biasing means.

4,430,659

PROTUBERANT OPTICAL RECORDING MEDIUM

Kent N. Maffitt, Minneapolis; William B. Robbins, Maplewood, both of Minn., and Richard F. Willson, Hudson, Wis., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Feb. 13, 1981, Ser. No. 234,111
Int. Cl.³ G01D *15/34*
U.S. Cl. 346—135.1 **18 Claims**



1. A recording medium for use with a focused laser beam, said recording medium having a substrate and a light-absorbing layer adjacent thereto for absorbing light from the laser beam is localized regions to thereby provide information storage, wherein in the improvement said light-absorbing layer comprises amorphous carbon having a thickness of less than 60 nm and a plasticity sufficient to allow plastic deformation upon localized heating resulting from impingement by said laser beam to enable the formation of localized protuberances which can subsequently be optically detected.

4,430,660

PEN DRIVING MECHANISM

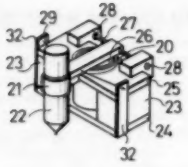
Shigeru Araki, Tamayama, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

Filed Mar. 19, 1982, Ser. No. 359,849
Claims priority, application Japan, Mar. 19, 1981, 56-38646
Int. Cl.³ G01D *13/16*
U.S. Cl. 346—139 R **12 Claims**

1. A pen driving mechanism for driving and controlling a recording pen relative to a recording surface, comprising:
a moving coil for actuating said recording pen;

a pair of magnetic circuits arranged so as to interlink their magnetic fluxes to said moving coil;

a holder member for holding said recording pen; and



a supporting device for supporting said holder member;

said moving coil being supplied with an electric current to drive said recording pen.

4,430,661

METHOD AND APPARATUS FOR IMAGE REPRODUCTION

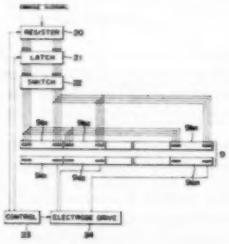
Noriyoshi Tarumi; Masahiko Matsunawa, and Hiroshi Tokunaga, all of Hachioji, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Japan

Filed May 20, 1981, Ser. No. 265,353

Claims priority, application Japan, May 26, 1980, 55-69000

Int. Cl.³ G01D *15/06*

U.S. Cl. 346—153.1 **9 Claims**



5. In an image recording apparatus,

an ion generator,

an ion modulation electrode for modulating an ion flow generated by said ion generator and divided electrically into a plurality of groups disposed in end-to-end relation,

a charge receptor for receiving the modulated ion flow and disposed for relative movement with respect to said electrode in a direction transverse to the end-to-end relation of said electrode groups, and

means for receiving an information containing signal formed of sequential information elements and for applying to said groups a predetermined sequentially received number of said information elements for impression on said charge receptor of an ion flow modulated concurrently by said sequentially received number of information elements, thereby effectively increasing the rate at which an image corresponding to an information signal is impressible on the charge receptor.

4,430,662

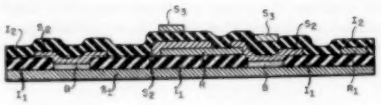
SUPERCONDUCTIVE TUNNEL JUNCTION INTEGRATED CIRCUIT

Don W. Jillie, Jr., Arlington, and Lawrence N. Smith, Lexington, both of Mass., assignors to Sperry Corporation, New York, N.Y.

Filed Apr. 9, 1981, Ser. No. 252,528

Int. Cl.³ H01L *39/22, 27/12*

U.S. Cl. 357—5 **30 Claims**



1. A superconductive integrated circuit including at least one superconductive tunnel junction, said tunnel junction including first and second tunnel junction electrodes superposed with respect to each other with a superconductive tunneling barrier therebetween for conducting supercoonductive tunneling current between said first and second tunnel junction electrodes, said integrated circuit comprising,

a first layer of superconductive material, said first layer including said first tunnel junction electrode, and

a second layer of superconductive material superposed with respect to first layer, said second layer including said second tunnel junction electrode,

one of said first and second layers of superconductive material forming a ground plane for said integrated circuit as well as forming said tunnel junction electrode included therein.

4,430,663

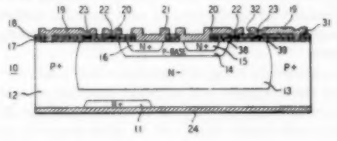
PREVENTION OF SURFACE CHANNELS IN SILICON SEMICONDUCTOR DEVICES

Frederick A. D'Altroy, Center Valley, and Richard Lindner, Bethlehem, both of Pa., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 25, 1981, Ser. No. 247,519

Int. Cl.³ H01L *29/40*

U.S. Cl. 357—53 **6 Claims**



1. A semiconductive device comprising a silicon body having a substantially planar major surface which is intersected by at least one PN junction separating two surface zones of the body of opposite conductivity type, a dielectric film over the portion of said planar surface which includes the PN junction and the portions of the two zones contiguous to the PN junction, the dielectric film comprising a continuous layer of silicon dioxide overlying and contiguous to the planar surface and a layer of silicon nitride overlying and contiguous to the silicon dioxide layer, the silicon nitride layer being segmented to provide an intermediate region spaced from the PN junction boundary where the silicon oxide is free of overlying silicon nitride, and field electrode means comprising a conductive film overlying and contiguous with the silicon nitride layer and the portion of the silicon oxide layer free of overlying silicon nitride.

4,430,664

GLASS-MOULDED TYPE SEMICONDUCTOR DEVICE

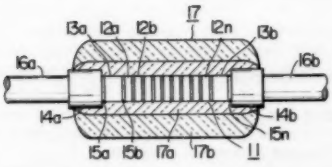
Akira Matsunaga, and Keiichi Morita, both of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 911,309, Jun. 1, 1978, abandoned. This application Sep. 16, 1980, Ser. No. 187,628

Claims priority, application Japan, Jun. 6, 1977, 52-65785; United Kingdom, May 31, 1978, 25535/78; Fed. Rep. of Germany, Jun. 5, 1978, 2824606

Int. Cl.³ H01L 23/30, 29/34, 23/02, 23/42

U.S. Cl. 357—73 1 Claim



1. A glass-moulded type semiconductor device comprising:

a semiconductor arrangement composed of at least one semiconductor pellet having at least one P-N junction, edges of which are exposed to peripheral surfaces of the semiconductor pellet;

a pair of electrodes secured to opposite ends of said semiconductor arrangement through a brazing material;

a first mould glass layer secured to the entire circumferential surface of said semiconductor arrangement and extending to the surfaces of said electrodes for passivating the P-N junction of said semiconductor arrangement; and

a second mould glas in the form of at least one layer secured to the surface of said first mould glass layer by sintering the second mould glass layer on the first mould glass layer after the first mould glass layer is formed, wherein said second mould glass layer has a thermal expansion coefficient sufficiently greater than the thermal expansion coefficient of the first mould glass layer so that after cooling said second mould glass layer following sintering a compressional pre-stress force is exerted by said second mould glass layer on said first mould glass layer,

the thermal expansion coefficient of each of said mould glass layers being selected in such a manner that the thermal expansion coefficient of said first glass layer is larger than an apparent thermal expansion coefficient of a semiconductor assembly comprising said semiconductor arrangement and said brazing material, and

wherein the thermal expansion coefficient of the second mould glass layer is set to be sufficiently greater than the thermal expansion coefficient of the first mould glass layer so that said compressional pre-stress force exerted by the second mould glass layer on the first mould glass layer will be sufficient to prevent breakage of the first and second mould glass layers during heating and expansion of the first mould glass layer when the semiconductor arrangement is in a conductive condition, said heating and expansion of the first mould glass layer being caused by the contacting relationship between the first mould glass layer and the semiconductor arrangement, and further

wherein the difference in thermal expansion coefficients between said semiconductor assembly and said first mould glass layer is substantially not larger than 0.5×10^{-6}/°C., and the difference in thermal expansion coefficients between said first and second mould glass layers is substantially in the range of 0.2×10^{-6}/°C. to 0.5×10^{-6}/°C.

4,430,665

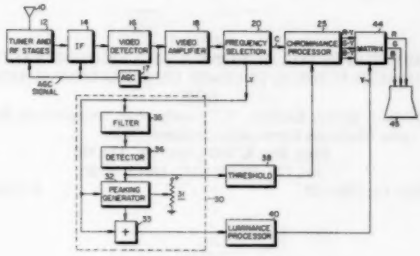
AUTOMATIC VIDEO SIGNAL PEAKING AND COLOR CONTROL

Larry A. Cochran, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 14, 1981, Ser. No. 330,386

Int. Cl.³ H04N 9/535

U.S. Cl. 358—37 14 Claims



1. In a system for processing a color image representative video signal including luminance and chrominance signal components, apparatus comprising:

filter means for selectively passing high frequency components, including noise, of said video signal;

peaking control means responsive to the magnitude of said selectively passed high frequency components for producing a controllably peaked luminance signal in response to the magnitude of passed high frequency components exhibiting a first sense, and for producing a controllably depeaked luminance signal in response to the magnitude of passed high frequency components exhibiting a second sense, relative to a nominal peaking condition of said luminance signal; and

means for attenuating said chrominance signal in response to the magnitude of said passed high frequency components of said second sense corresponding to said produced depeaked condition of said luminance signal.

4,430,666

PHOTOELECTRIC CONVERTING DEVICE

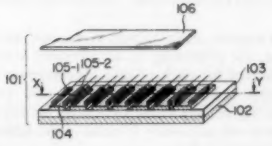
Hisashi Nakatsui, Kawasaki, and Yoshioki Hajimoto, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 22, 1982, Ser. No. 350,727

Claims priority, application Japan, Feb. 27, 1981, 56-27752; Feb. 27, 1981, 56-27753; Feb. 27, 1981, 56-27754

Int. Cl.³ H04N 9/07

U.S. Cl. 358—44 46 Claims



1. A photoelectric converting device comprising:

a substrate;

a photoconductive layer having a plurality of image elements and comprising an amorphous material having silicon atoms as a matrix;

a plurality of variously colored colorant layers provided

directly on said photoconductive layer, one such colorant layer provided separately for each said image element;

a plurality of image element electrodes provided on said respective colorant layers for taking out electric signals separately for said respective image elements corresponding to light signals inputted to said photoconductive layer; and

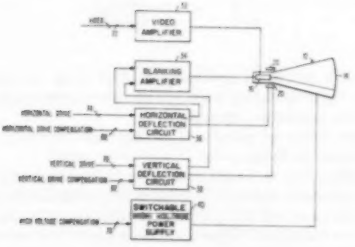
a plurality of counter-electrodes, one such counter-electrode coupled with each of said image element electrodes.

4,430,667

APPARATUS FOR OBTAINING MULTICOLOR RASTER IMAGES USING A VOLTAGE PENETRATION SCREEN CRT

Kevin J. Gorga, Endwell, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 4, 1982, Ser. No. 336,799
Int. Cl.³ H04N *9/27*; H01J *29/80*
U.S. Cl. 358—73 **8 Claims**



1. Apparatus for causing a beam penetration color cathode ray tube, having horizontal and vertical deflection means for scanning the beam thereof across the face of said tube at predetermined horizontal and vertical scan rates and a phosphor composite coated screen that emits light which changes color as a function of the accelerating voltage applied to the impinging beam thereof, to exhibit video information in a predetermined number of displayable colors, said apparatus comprising:

(a) video amplifying means, connected between a source of video information and said cathode ray tube, for increasing a received video signal to sufficient levels for the display thereof;

(b) horizontal scan circuit means, connected to said horizontal deflection means, for causing the rate of horizontal scanning of said electron beam to be a multiple of its predetermined rate and said predetermined number of colors to be exhibited;

(c) vertical scan circuit means, connected to said vertical deflection means, for causing the rate of vertical scanning of said electron beam to be a multiple of its predetermined rate and said predetermined number of colors to be exhibited;

(d) power supply circuit means, connected to said cathode ray tube, for providing an accelerating voltage for said beam thereof for each of said predetermined number of displayable colors to be exhibited, said power supply accelerating voltage being switchable to and between the different levels necessary to achieve the different possible phosphor colors; and

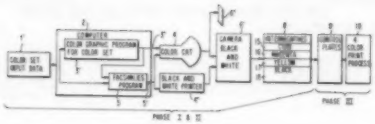
(e) control circuit means, connected to said horizontal scan circuit means, said vertical scan circuit means and said power supply circuit means, for supplying horizontal and vertical drive pulse signals for said horizontal and vertical scan circuit means and for determining when, in response to scan completions, said power supply circuit means is to be switched and to what accelerating voltage level and for then causing the same to occur.

4,430,668

DIGITAL FACSIMILES (FAST ADDITIVE COLOR SEPARATION INTERNEGATIVES MILES)

Ernest P. Miles, Jr., 2804 St. Leonard Dr., Tallahassee, Fla. 32312

Filed Aug. 10, 1981, Ser. No. 291,479
Int. Cl.³ H04N *1/46*
U.S. Cl. 358—75 **32 Claims**



1. For certain multiple color (R G B) systems specified herein the method of

a. reading first signals representing unfiltered data for an additive color graphic image to be displayed on a color CRT output device of a computer,

b. generating therefrom second signals representing needed data for recreating by printing a color facsimile of that display using subtractive pigment combinations which match the color of that display position by position,

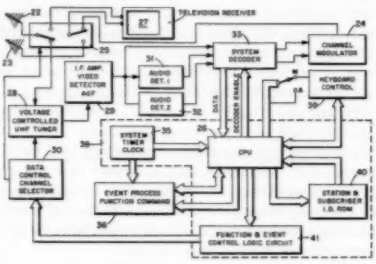
c. producing and displaying internegative images in black and white representing levels of each subtractive primary needed in printing the same on a three color press.

4,430,669

TRANSMITTING AND RECEIVING APPARATUS FOR PERMITTING THE TRANSMISSION AND RECEPTION OF MULTI-TIER SUBSCRIPTION PROGRAMS

William S. H. Cheung, Hong Kong, Hong Kong, assignor to Payview Limited, Kowloon, Hong Kong

Filed May 29, 1981, Ser. No. 268,640
Int. Cl.³ H04N *7/16*; H04K *1/04*
U.S. Cl. 358—122 **12 Claims**



1. A multichannel receiver for selectively tuning one of several pay television stations during programming hours which broadcast scrambled video signals, each of said stations broadcasting during non-programming hours related subscriber identification information and program identification information, comprising:

a voltage controlled tuner for tuning the frequency of each of said stations in response to an operating voltage;

a read only memory for storing tuning information identifying the frequency of each of said stations and a subscriber identification number;

a Random Access Memory for storing received program identification information;

a system clock for providing periodic timing pulses;

video processing circuitry for removing and separating said video signals and information signals from a broadcast signal received by said tuner;

a control processor having I/O parts connected to said

memories, and video processing circuitry, said processor being connected to said clock, and during non-programming hours said processor being connected to continually and sequentially read out of said Read Only Memory tuning information for each of said television stations, said processor further comparing subscriber identification information provided by said video circuitry to subscriber identification data in said Read Only Memory each time a station frequency is tuned and upon coincidence thereof stores said related program identification information including status identification data and program time in said RAM at a specified address;

means for addressing and reading out from said Random Access Memory said stored information during program broadcast time; and

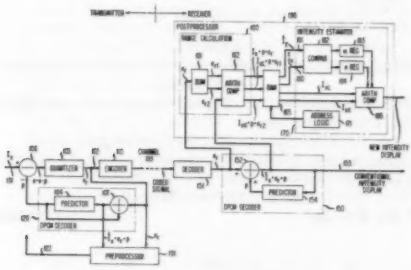
means for tuning the television receiver tuner in response to said read out information whereby said television receives a station signal identified by said stored information at a frequency and time.

4,430,670

RECONSTRUCTION OF QUANTIZED DPCM OR PCM SIGNALS

Arun N. Netravali, Westfield, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 12, 1982, Ser. No. 357,405
Int. Cl.³ H04N *7/12*
U.S. Cl. 358—135 **28 Claims**



1. A method of reconstructing the value of samples of a correlated signal which have been quantized, said quantized samples each having a representative value associated with one of a predefined set of mutually exclusive quantization levels having upper and lower limits, characterized by

determining a range for said reconstructed value of a present sample, based upon said upper and lower limits of said quantizer level associated with said representative value for said present sample, and

assigning said reconstructed value within said range as a function of reconstructed values of samples spatially or temporally correlated with said present sample.

4,430,671

TELEVISION CHANNEL INDICATOR WITH AUTOMATIC ON-SCREEN DISPLAY

Gregory G. Tamer, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

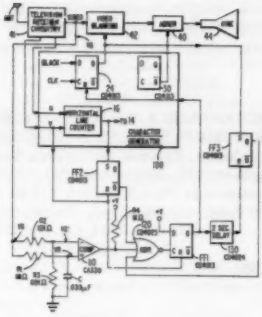
Filed Feb. 24, 1982, Ser. No. 352,002
Int. Cl.³ H04N *5/50*
U.S. Cl. 358—192.1 **15 Claims**

1. In a television receiver which develops an image on an image display device in response to a video signal occurring during image intervals, apparatus for selectively developing a character on said display device comprising:

means for generating character signals to produce on said display device said character in response to a character command signal;

detector means for detecting a predetermined amplitude condition of said video signal over a portion of said image interval; and

command means responsive to said detector means detecting said predetermined amplitude condition for generating said character command signal.



2. The apparatus of claim 1 wherein said character represents a television channel which is selected by said television receiver.

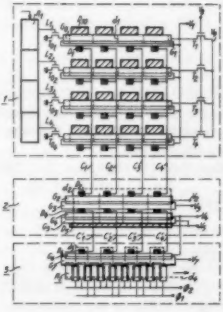
3. The apparatus of claim 1 wherein said predetermined amplitude condition corresponds to said video signal developing a substantially blank image on said display device.

4,430,672

PHOTOSENSITIVE DEVICE READ BY CHARGE TRANSFER

Jean Luc Berger, Paris, France, assignor to Thomson CSF, Paris, France

Filed Feb. 5, 1981, Ser. No. 237,996
Claims priority, application France, Apr. 23, 1980, 80 09112
Int. Cl.³ H04N *3/14*
U.S. Cl. 358—213 **35 Claims**



1. A photosensitive device read by charge transfer, wherein it has

n lines of m photosensitive points, each photosensitive point being constituted by the integration of a semiconductor substrate of an MOS capacitor (C_O), having a grid G_0 common to the points of the same line and a reading diode D_1 separated from grid G_0 by a screen grid G_1 raised to a constant potential (V_1), m metallic connections ($C_1 \ldots C_m$) connecting in parallel n diodes belonging to different lines;

m diodes D_2 integrated on to the same semiconductor sub-

strate to which lead the m metallic connections, said diodes being followed by a grid G_2 raised to a constant potential (V_2);

removing means on a diode (D_3) of the charges accumulated on diodes D_1 and D_2 during each time interval when none of the grids G_0 is at zero;

at least one shift register (R_1) making it possible to periodically zero each grid G_0 and remove the signal charges on diodes D_1, and diodes D_2;

means ensuring the transfer of the signal charges arriving beneath diodes D_2 to a charge transfer read register (R_2) with m parallel inputs and a series output.

4,430,673

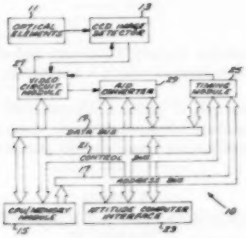
PROGRAMMABLE SCAN/READ CIRCUITRY FOR CHARGE COUPLED DEVICE IMAGING DETECTORS

Phil M. Salomon, Tujunga, and Kalman Smilowitz, Playa del Rey, both of Calif., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jun. 24, 1981, Ser. No. 276,749

Int. Cl.³ H04N *3/15*

U.S. Cl. 358—213 **19 Claims**



19. A circuit for scanning and selectively reading out a charge coupled device (CCD) including:

means operative for determining if a predetermined portion less than the entire CCD meets a predetermined control parameter; and

timing control processing means for reading only that portion of the CCD which meets said control parameter.

4,430,674

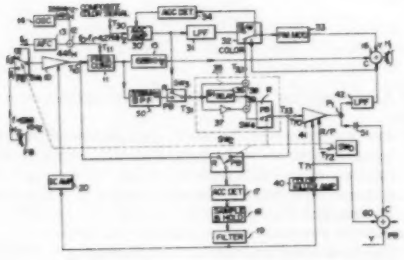
COLOR VIDEO SIGNAL PROCESSING CIRCUIT

Shinichiro Taguchi; Nobuya Nagao, and Yutaka Ogihara, all of Fukaya, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Feb. 25, 1981, Ser. No. 238,026

Int. Cl.³ H04N *9/49*

U.S. Cl. 358—317 **4 Claims**



3. A signal processing circuit for use in both record and playback modes of operation of a video type recorder (VTR) comprising:

a signal gate circuit for (a) receiving a color video signal to be recorded on a storage medium during record mode operation or read from said storage medium during playback mode and (b) selectively transmitting a signal corresponding to said color video signal to an output thereof responsive to a control signal applied to a control signal input thereof;

AC signal bypassing means coupled to the output of said signal gate circuit for bypassing an AC signal component thereof;

a first signal transmission path coupled to an output of said AC signal bypassing circuit for conducting a color killer signal when said VTR is operating in its record mode;

a second signal transmission path connected to the output of said signal gate circuit for blocking a DC signal component and conducting said color signal during playback mode operation of said VTR;

a control signal generating circuit for supplying a first or second control signal to said control signal input of said signal gate circuit for controlling said signal gate circuit; and

mode switching means for switching to operate said VTR in a first mode in which said first or second control signal is impressed upon said control signal input and a second mode in which said control signal input terminal is held at a predetermined potential and the voltage at the output terminal of said signal gate circuit is made constant independent of the output of said control signal generating circuit.

4,430,675

STILL PICTURE RECORDING AND REPRODUCING SYSTEM

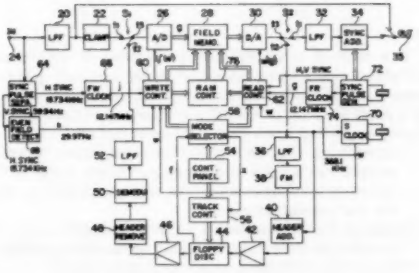
Toshiro Fujime, Takatsuki, Japan, assignor to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Apr. 1, 1981, Ser. No. 249,889

Claims priority, application Japan, May 2, 1980, 55-61131[U]; Jul. 18, 1980, 55-99143; Nov. 10, 1980, 55-158627

Int. Cl.³ H04N *5/781, 5/93*

U.S. Cl. 358—342 **7 Claims**



1. A still vision recording and reproducing system comprising:

first switch means having first, second and third terminals, said third terminal being selectively connectable to either one of said first or second terminals, said first terminal having an input that includes a television signal;

memory means connected to said third terminal of said first switch means for storing the television signal;

second switch means having first, second and third terminals, said memory means being connected to said second switch means' third terminal which is selectively connectable to either one of said first or second terminals of the second switch means, said first terminal of the second

switch means being adapted to supply television signal of still vision;

a frequency modulator connected to said second terminal of the second switch means;

recorder means including a record connected to said frequency modulator;

a demodulator connected between said recorder means and said second terminal of the first switch means;

mode control means connected to the first and second switch means for controlling the mode of operation between a recording mode and a playing mode thereof, respectively;

said first switch means being so actuated during said recording mode as to connect its third terminal with its first terminal for writing the television signal in said memory means, and said second switch means being so actuated as to connect its third terminal with its second terminal for reading the memory means and sending a written television signal in expanded form in time domain through said frequency modulator to said recorder means for recording said television signal;

said first switch means being so actuated during said playing mode as to connect its third terminal with its second terminal for writing the television signal, which has been reproduced from the recorder means and demodulated in said demodulator, in said memory means, and said second switch means being so actuated as to connect its third terminal with its first terminal for reading the memory means and sending out the written television signal in compressed form in time domain for the reproduction thereof as a still vision;

low frequency pulse supplying means coupled to said mode control means for supplying low frequency pulses to said memory means during said recording mode for affecting the reading of the television signal at a low speed;

means for diverging said low frequency pulses from said low frequency pulse supplying means;

means for supplying said diverged low frequency pulses to said recorder for recording said diverged low frequency pulses on said record simultaneously with the recording of said television signal on said record; and

means for reproducing said recorded low frequency pulses simultaneously with the reproduction of said recorded television signal.

4,430,676

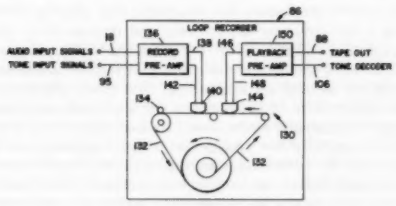
CONTROL APPARATUS FOR SELECTIVELY RECORDING SIGNALS

Michael K. Johnson, 5314 Franklin Ave., Apt. No. 5, Hollywood, Calif. 90027

Continuation of Ser. No. 134,525, Mar. 27, 1980, abandoned. This application Apr. 30, 1982, Ser. No. 373,632

Int. Cl.³ G11B *27/08*

U.S. Cl. 360—13 **10 Claims**



2. Apparatus to control the recording of an input signal on a recorder, the input signal having first signals and second signals, each of the second signals being of a time duration up to a predetermined maximum and each of the first signals being of any time duration greater than the predetermined maximum, comprising:

(a) means, responsive to the input signal, for automatically distinguishing the first signals from the second signals as a function of time duration; and

(b) means, connected to said automatically distinguishing means for producing recorder control signals to activate a recorder in order to record each of the first signals and to deactivate the recorder to prevent recording of the second signal;

said automatically distinguishing means further including timing means responsive to the start of each of the first signals and the second signals for generating one data signal for the predetermined maximum time duration and for generating another data signal after the predetermined maximum time duration lapses and means for storing each one data signal and each other data signal;

said producing means including means for generating marking signals identifying the start of each of the first signals and the second signals and means responsive to the marking signals for controlling said storing means to output the one data signal and the other data signal as recorder control signals.

4,430,677

CASSETTE TAPE RECORDER

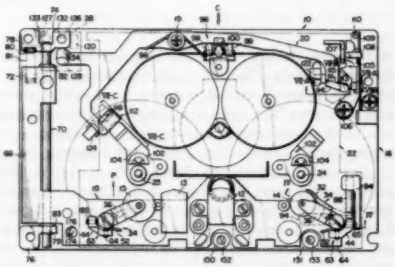
Akira Osanai, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Sep. 21, 1981, Ser. No. 304,080

Claims priority, application Japan, Sep. 25, 1980, 55-133166

Int. Cl.³ G11B *19/00*

U.S. Cl. 360—966 **2 Claims**



1. A cassette tape recorder provided with a Kangaroo pocket type cassette holder movably mounted on an immovable board so as to move between a first position and a second position wherein the cassette holder is farther from the immovable board than the first position,

characterized in that the cassette holder comprises:

at least one guide pin slidably supported on the immovable board so as to be slidable in a cross direction relative to the immovable board;

a fitting member fixed to the guide pin so as to be movable between first and second positions respectively corresponding to the first and second positions of the cassette holder, the fitting member maintaining a parallel relationship to the immovable board at said first and second positions of the fitting member;

a cassette holder body detachably holding a tape cassette and swingably connected to the fitting member so as to be swingable between a first position wherein the cassette holder body is parallel to the immovable board and a second position wherein the cassette holder body is inclined to the immovable board;

kick spring means which accumulates an urging force for urging the fitting member toward the second position thereof when the fitting member moves from the second position thereof to the first position thereof; and

stop means for suddenly stopping the sliding movement of

the guide pin at the second position of the fitting member when the fitting member moves from its first position to its second position, thereby causing the cassette holder body to swing from its first position to its second position.

4,430,678

DRIVE APPARATUS FOR RECORDING DISKS IN WHICH THE DISK IS CLAMPED BETWEEN A DRIVEN RECESSED MEMBER AND A ROTATABLY MOUNTED CLAMPING MEMBER

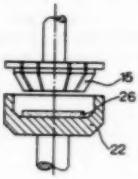
Joachim Hack, Ludwigshafen; Roland Brotzler, Hochdorf-Assenheim; Klaus Schulze-Berge, Ludwigshafen, and Rudolf Angermann, Offenburg, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed May 1, 1981, Ser. No. 259,654

Claims priority, application Fed. Rep. of Germany, May 30, 1980, 3020525

Int. Cl.³ G11B *25/04*

U.S. Cl. 360—99 **5 Claims**



1. A driving apparatus for a recording disk having a central aperture, particularly a flexible magnetic disk in an envelope, comprising: a driven recessed member; a rotatably mounted clamping member of the type expanding radially in response to the exertion of an axial force thereon; each said member having a clamping surface; means for moving the clamping member toward the recessed member to clamp, at the end of the clamping stroke, the disk upon the introduction of its central aperture between said clamping surfaces; and spring means being interposed between the leading planar surface of said clamping member and the inner bottom of said recessed member such that, prior to the completion of the clamping stroke, by means of said spring means, said clamping member is axially compressed and thus radially expanded against said central aperture to displace said disk toward a centered position and is yieldably coupled to said recessed member to enable said clamping member to be rotatably taken along by said recessed member if said recessed member is rotated prior to the completion of said clamping stroke.

4,430,679

MAGNETICALLY SHIELDED CARRYING ARM ARRANGEMENT FOR A MAGNETIC DISC STORAGE

Oelke van de Bult, The Hague, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 24, 1981, Ser. No. 305,311

Claims priority, application Netherlands, May 22, 1981, 8102521

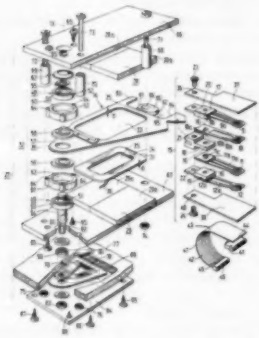
Int. Cl.³ G11B *5/55*

U.S. Cl. 360—106 **8 Claims**

1. A carrying arm arrangement for moving and positioning a magnetic head over a surface of a rotatable magnetic disc of a magnetic disc storage apparatus for digital data, the arrangement comprising:

a movable carrying arm, and a magnetic head connected to the carrying arm, the head having an outer side facing away from the disc surface during normal operation of the storage apparatus,

characterized in that a mu-metal shield for shielding the head from spurious magnetic fields is disposed at the head outer side and is connected to the carrying arm, the shield extending a distance beyond the magnetic head, whereby the shield is movable with the head.



4,430,680

RECIPROCATING MEMBER CONTROL MECHANISM IN TAPE PLAYER

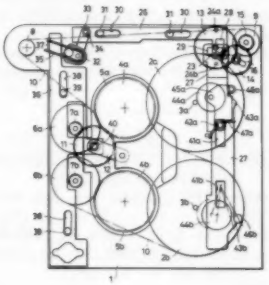
Katsumi Yamaguchi, and Hitoshi Okada, both of Toda, Japan, assignors to Clarion Co., Ltd., Tokyo, Japan

Filed Sep. 29, 1981, Ser. No. 306,684

Claims priority, application Japan, Sep. 30, 1980, 55-135157; Sep. 30, 1980, 55-138082[U]

Int. Cl.³ G11B *15/00*

U.S. Cl. 360—137 **2 Claims**



1. A control mechanism for a magnetic tape playing device having a tape drive motor, forward and reverse drive reelbases, forward and reverse drive capstan shafts driven by said motor, forward and reverse drive pulleys driven by said motor, said control mechanism comprising: first drive changeover means supported to be reciprocated for selectively supplying drive power from said motor to said forward and reverse drive reelbases; second drive changeover means supported to be reciprocated for selectively engaging said forward and reverse drive capstan shafts to an inserted tape; a power takeoff pulley drive by said motor; an engagement means for selectively actuating engagement with said first and second drive changeover means; an electromagnetic plunger means; and a rotation transmitting means operable by said electromagnetic plunger means to impart the rotation from said power takeoff pulley to said engagement means, said first drive changeover means including a slider plate mounted for reciprocation, an idler plate mounted for reciprocation and coupled to be driven by said slider plate, an idler movably responsive to the position of

said idler plate to be selectively interposable to couple said forward drive pulley to said forward drive reelbase or said reverse drive pulley to said reverse drive reelbase, said second drive changeover means including a pair of displaceable pinch rollers for pressing said tape against said forward and reverse drive capstan shafts respectively, a change plate mounted for reciprocation and coupled to actuate said pinch rollers selectively against their associated capstan shafts, said engagement means including an arc-shaped cam rotatably provided on a cam gear, there being formed in said slider plate and change plate elongated holes in which said cam is engaged, the width of said elongated hole being nearly equal to the radius of said can so that the arc-shaped circumferential surface of said cam is slidable along the edge portion of said elongated hole, said rotation transmitting means including a movable idler gear coupled with said plunger means and a driving gear provided on said power takeoff pulley, said idler gear being engageable with said driving gear and said cam gear when said plunger means is energized.

4,430,681

OVERLOAD PROTECTION ARRANGEMENT FOR AN ELECTRIC MOTOR, ESPECIALLY OF A HAND-HELD POWER TOOL

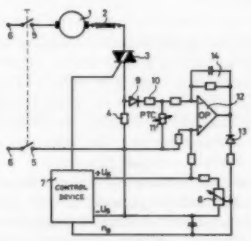
Rolf Benzing, Neuffen, Fed. Rep. of Germany, assignor to Metabowerke GmbH & Co., Nuertingen, Fed. Rep. of Germany

Filed May 22, 1981, Ser. No. 266,355

Claims priority, application Fed. Rep. of Germany, Jun. 10, 1980, 3021689

Int. Cl.³ H02H *7/085*

U.S. Cl. 361—27 **6 Claims**



1. An overload protection arrangement for an electric motor equipped with an electronic speed of rotation control device, especially of a hand-held power tool, comprising means for detecting the temperature of a winding of the electric motor which is in danger of overload under certain operating conditions, including a positive temperature coefficient resistor; and means for reducing the magnitude of the maximum current that can be drawn by the electric motor in response to the detection of an excessive temperature by said detecting means, including a voltage divider incorporating said resistor as one of its constituent parts, and an operational amplifier having one input connected from said resistor and an output connected to the electronic speed of rotation control device and operative for controlling the latter so that the desired value of the speed of rotation which is supplied to the electronic speed of rotation control device is reduced when the acceptable temperature of the respective winding is exceeded.

4,430,682

PROTECTION CIRCUIT FOR D.C. MOTORS

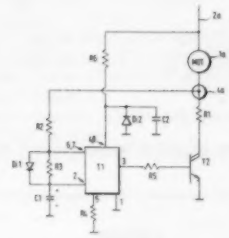
Alfred Babsch, Ulm-Söflingen, Fed. Rep. of Germany, assignor to Mannesmann AG, Duesseldorf, Fed. Rep. of Germany

Filed Oct. 30, 1981, Ser. No. 316,894

Claims priority, application Fed. Rep. of Germany, Nov. 3, 1980, 3042138

Int. Cl.³ H02H *7/085*

U.S. Cl. 361—31 **4 Claims**



1. A protective circuit for a d.c. motor driving a load that may experience excessive increases, such as paper jamming in a paper feeder driven by the motor, comprising:

first circuit means connected to the motor for monitoring current flow therethrough and providing a signal representative thereof;

transistor-switching means connected in series with the motor for controlling the current flow through the motor;

a second circuit means including a bistable multivibrator and RC circuit means connected to inputs of the bistable multivibrator to render the multivibrator monostable and astabie, depending upon a signal level applied to the inputs, the multivibrator connected to the transistor-switching means for operating the same; and

the first circuit means connected to inputs providing thereto said first signal operating said multivibrator as a monostable multivibrator in response to said first signal in a first range for causing the transistor-switching means to turn the motor on intermittently whenever the multivibrator is in the astable state pursuant to its operation as an astable device and operating the multivibrator as a monostable multivibrator in response to said first signal in a second range.

4,430,683

GROUND FAULT DETECTING DEVICE FOR USE WITH A DC CIRCUIT

Tadao Kawai, and Tomoharu Nakamura, both of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 24, 1982, Ser. No. 351,766

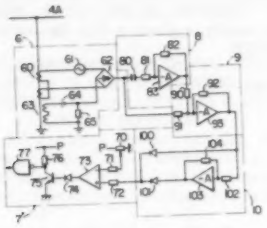
Claims priority, application Japan, Feb. 27, 1981, 56-27001

Int. Cl.³ H02H *3/16*

U.S. Cl. 361—42 **7 Claims**

1. A ground detecting device for detecting a ground fault in a DC circuit through which a DC power is obtained by converting an AC power by an AC–DC converter, and which is connected at its earth point to the earth and provided with an earth current detector for detecting an earth current flowing through the earth point, said device comprising DC component detecting means for detecting a DC component contained in the earth current detected by said earth current detector, and judging means for judging a ground fault which has occurred in the DC circuit, said DC component detecting means

including a differential circuit for differentiating the earth current, and an adder for producing the DC component on the



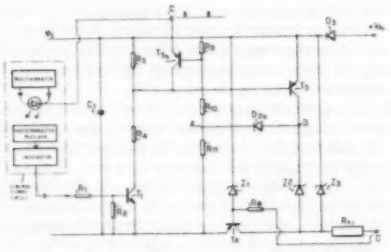
basis of the output of said differential circuit and said earth current.

4,430,684

TRANSISTOR SWITCHING MEANS

Marcel Lefebvre, Angouleme, and Daniel Ruellan, L'Isle d'Espagnac, both of France, assignors to La Telemecanique Electrique, France

Continuation of Ser. No. 153,792, May 28, 1980, abandoned. This application Jun. 9, 1982, Ser. No. 386,482
Claims priority, application France, May 30, 1979, 79 13763
Int. Cl.³ H02H 3/08, 7/20
U.S. Cl. 361—98 2 Claims



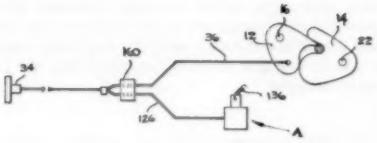
1. A switching circuit of the kind comprising a principal switching transistor feeding into a load and unblocked by injection of a substantially constant current into its base in response to application of a control signal to the circuit, the said circuit comprising means for comparing the collector-emitter voltage of the principal transistor with a reference voltage and for blocking the said transistor as soon as the said collector-emitter voltage exceeds the reference voltage, the said control signal being produced by a circuit which generates recurrent pulses and separately derives from said pulses the said control signal said means comprising an auxiliary transistor coupled to the principal transistor in such a manner that the said auxiliary transistor, when blocked, becomes unblocked when, as a result of overloading in the load, the voltage drop at the terminals of the principal transistor increases beyond the reference voltage and the unblocking of the auxiliary transistor then having the effect of blocking the principal transistor, means for applying the said recurrent pulses to the auxiliary transistor to block it periodically, thereby ensuring the automatic unblocking of the principal transistor as soon as the overload has disappeared, even though the substantially constant current is being injected into the base of the principal transistor in response to said control signal being applied to said switching circuit.

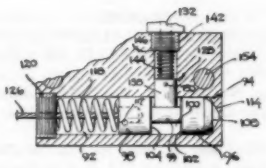
4,430,685

VEHICLE LOCK RELEASE MECHANISM OPERABLE WITH A SAFETY INTERLOCK SYSTEM

Thomas R. Ellsberg, 6339 Coldwater Canyon, North Hollywood, Calif. 91606

Continuation-in-part of Ser. No. 709,314, Jul. 28, 1976, abandoned. This application Jan. 3, 1978, Ser. No. 866,359
Int. Cl.³ E05B 65/19
U.S. Cl. 361—172 35 Claims





1. An electrically operable lock controlling mechanism and being operable to control a lock device which is capable of locking a closure member movable relative to an access opening when said closure member is in a closed position over said access opening, said lock controlling mechanism comprising:

(a) an outer housing having a first bore and a second bore angularly located with said first bore,

(b) a shiftable lock cooperating element located within said first bore, said lock cooperating element having a pair of spaced apart members defining a plunger receiving space capable of being located in alignment with said second bore,

(c) a plunger located within said second bore and having a locking section capable of being shifted into a locking position in said plunger receiving space to prevent movement of said element, and capable of being retracted to a non-locking position

(d) means biasing said plunger into said locking position,

(e) electrically operable means for shifting said plunger to the non-locking position out of said plunger receiving space to permit movement of said lock cooperating element upon energization of said electrically operable means, and

(f) sensing means operatively connected to said electrically operable means for holding said plunger in the non-locking position after de-energization of said electrically operable means if said closure member has been moved away from the closed position and until said closure member is returned to the closed position.

4,430,686

CHARGER FOR ELECTROGRAPHIC SURFACES

Alan J. Brock, 26 Strangways Ter., North Adelaide, South Australia 5006; Alwin S. Clements, 35 Alexander St., Largs Bay, South Australia 5016, and Brian J. Horrocks, 12 Martins Rd., Paralowie, South Australia 5108, all of Australia

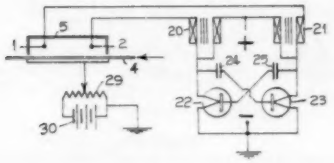
PCT No. PCT/AU81/00056, § 371 Date Jan. 12, 1982, § 102(e) Date Jan. 12, 1982, PCT Pub. No. WO81/03387, PCT Pub. Date Nov. 26, 1981

PCT Filed May 12, 1981, Ser. No. 341,996

Claims priority, application Australia, May 13, 1980, PE3511; May 13, 1980, PE3512

Int. Cl.³ H01T *19/00*

U.S. Cl. 361—229 3 Claims



1. For charging an electrophotographic surface by means of a corona directed to the surface, apparatus comprising a pair of spaced-apart corona wires, a planar control electrode extending generally parallel to a plane passing through the corona wires but spaced from the said plane, means for applying a high voltage between the said wires to cause a corona comprising an envelope with an ion core to be generated between the said corona wires, means to cause the said control electrode to have a potential of the same polarity but less than that applied to the said corona, means positioned to guide an electrophotographic membrane which is to be charged between the plane of the said corona wires and the said control electrode in a position to intersect the said envelope outside of the said core, and means to cause a relative movement between the said membrane and the said corona wires in a plane parallel to the said corona wires, said means for generating the corona comprising a first and second transformer connected together by means arranged to produce an electrical oscillation in the said transformers of opposite phase, the output of one said transformer being connected to one said corona wire and the output of the other said transformer being connected to the other said corona wire whereby to produce a corona between the said wires.

4,430,687

TRIM CONDENSER

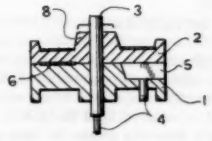
Karl Steinfelder; Ullrich Heisig; Siegfried Schiller, all of Dresden; Dietrich Mehr, Gera; Bernd Thusse, Gera, and Klaus Hielscher, Gera, all of German Democratic Rep., assignors to VEB Elektronik Gera, Gera, German Democratic Rep.

Filed Aug. 11, 1981, Ser. No. 291,897

Claims priority, application German Democratic Rep., Aug. 13, 1980, 223285

Int. Cl.³ H01G *5/06*

U.S. Cl. 361—293 11 Claims



1. A trimmer capacitor, adapted to be connected with an armature, comprising

a stator with a surface having a roughness ≦ about 0.7 μm,

a rotor with a surface having a roughness value ≦ about 0.7 μm,

a first adhesive layer applied to a portion of said stator surface,

a second adhesive layer applied to a portion of said rotor surface,

a first electrode applied to said first adhesive layer on said stator surface, said electrode comprising a copper-nickel alloy of from 1.5 μm to 3 μm thickness and 30% to 60% nickel content,

a second electrode applied to said second adhesive layer on said rotor surface, said electrode comprising a copper-nickel alloy of from 1.5 μm to 3 μm thickness and 30% to 60% nickel content,

a rotor shaft extending substantially through the center of the rotor and the stator,

a first soldering connection between said stator and armature, and

a second soldering connection between said rotor shaft and armature.

4,430,688

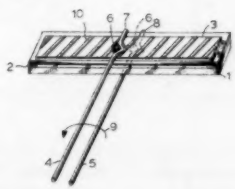
SMALL HEAT RESISTANT FILM CONDENSER

Tooru Tamura, Ikeda; Nobuyuki Ojima, Katano; Hideaki Mochizuki, Higashiosaka; Ryuichi Souno, Moriguchi, and Toshifumi Ikka, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 224,924, Jan. 14, 1981, abandoned. This application Apr. 28, 1983, Ser. No. 487,415

Int. Cl.³ H01G *1/14, 4/08*

U.S. Cl. 361—307 12 Claims



6. A film condenser comprising: a film product having a solderable metal foil composed of one member selected from the group consisting of copper, tin and aluminum, a heat resistant plastic film on one surface of said solderable metal foil, and a vapor-deposited metal film on the surface of said heat resistant plastic film facing away from said metal foil; and

two lead wires respectively soldered to the other surface of said solderable metal foil and to the surface of said vapor-deposited metal film facing away from said plastic film;

wherein each of said lead wires has a bent portion at the part soldered to said film product, said bent part being in the shape of a V or a U with the open end facing laterally of the length of the wire and having a size to prevent solder in a molten state from flowing out of the bent part during soldering due to the surface tension of the molten solder.

4,430,689

DIELECTRIC CERAMIC COMPOSITIONS, CAPACITORS IN WHICH COMPOSITIONS OF THIS TYPE ARE EMPLOYED, AND A METHOD OF PRODUCTION OF SAID COMPOSITIONS

Alain Lagrange, and Alain Beauger, both of Bagnolet, France, assignors to L.C.C.-C.I.C.E. Compagnie Europeenne de Composants Electroniques, Bagnolet, France

Filed Mar. 15, 1982, Ser. No. 357,896
Claims priority, application France, Mar. 18, 1981, 81 05403
Int. Cl.³ H01G 4/12
U.S. Cl. 361—321 6 Claims

1. A multilayer ceramic capacitor comprising a plurality of electrodes of an electrically conducting material including a major proportion of silver, said electrodes being separated by a plurality of ceramic dielectric layers, two successive electrodes being separated by at least one dielectric layer, the electrodes of even-numbered rows and odd-numbered rows being respectively connected together electrically, wherein the ceramic composition is a dielectric ceramic composition having a high dielectric constant, wherein said composition contains 90% to 98.5% by weight of barium titanate and 1.5% to 10% by weight of lithium fluoride, in which the barium titanate corresponds to the formula:

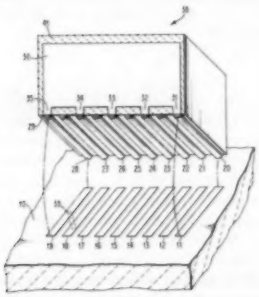
$BaTiO_3$ with a molar ratio $x=(TiO_2/BaO)$, wherein x is higher than or equal to 0.97 and lower than or equal to 0.98.

4,430,690

LOW INDUCTANCE MLC CAPACITOR WITH METAL IMPREGNATION AND SOLDER BAR CONTACT

Dudley A. Chance, Danbury, Conn.; Chung W. Ho, Chappaqua, N.Y., and Timothy C. Reiley, Ridgefield, Conn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 7, 1982, Ser. No. 433,329
Int. Cl.³ H01G 1/01, 3/06
U.S. Cl. 361—321 18 Claims



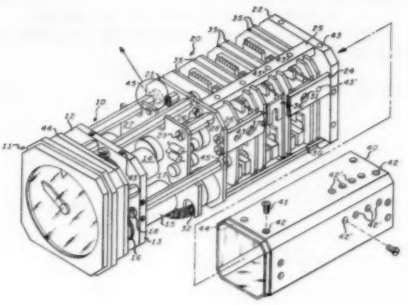
1. In a chip carrier for large scale integrated circuit chips, with a laminated capacitor joined to the surface of said carrier adjacent to positions where chips are located, said laminated capacitor including a plurality of capacitor plates, the improvement comprising bonding said capacitor to said chip carrier with an array of solder bars comprising an elongated strip of metallic material each of said bars connected to a set of said capacitor plates in said laminated capacitor by means of tab connections on said plates, whereby each of said plates is connected by a plurality of tabs to a plurality of said solder bars.

4,430,691

ELECTROMECHANICAL DISPLAY INSTRUMENT ASSEMBLY

Clyde M. Rea, Phoenix, Ariz., assignor to Sperry Corporation, New York, N.Y.

Filed Feb. 23, 1981, Ser. No. 237,328
Int. Cl.³ H02B 1/00
U.S. Cl. 361—383 1 Claim



1. An instrument container comprising:

a front assembly having a mounting plate with tapped screw holes therein;

a longitudinally extending first frame rigidly, attached to said mounting plate,

a second frame, longitudinally disposed relative to said first frame, including heat conductors adapted to thermally couple to heat generating elements, said heat conductors having tapped screw holes therein located at predetermined positions thereon,

a cover having holes therein positioned over said first and second frames,

a connector between said first and second frames adapted to provide relative longitudinal position adjustment of said first and second frames after connection thereof to align said tapped screw holes of said first and second frames, including said tapped screw holes in said heat conductors with said holes in said cover, thereby compensating for tolerance build-up during assembly, and

screws passing through said holes in said cover and threaded into said tapped screw holes in said first and second frames to provide tight physical contact of said first and second frames, including said heat conductors with said cover to establish structural rigidity and integrity, and provide for heat conduction from said second frame to said cover for dissipation therefrom by convection.

4,430,692

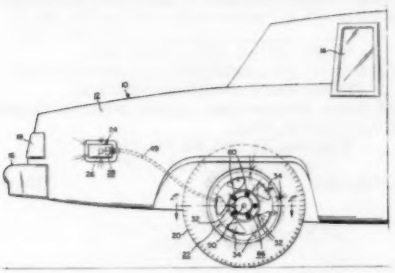
AUTOMOTIVE VEHICLE WHEEL ILLUMINATION AND LIGHT REFLECTIVE SYSTEM

Alexandros M. Papadakis, 250 Beverly Blvd., Upper Darby, Pa. 19082

Filed Jul. 27, 1981, Ser. No. 287,236
Int. Cl.³ F21V 7/04
U.S. Cl. 362—32 10 Claims

1. A vehicle having at least one rotatable wheel, said wheel having light reflective surface means thereon, a light source mounted on said vehicle, light directing means operatively associated with said wheel, a plurality of discrete fiber optic light transmission means operatively associated with said light source adapted to receive light therefrom and transmit the light to said light directing means for said wheel constituting light emitting and ray directing means operable to impinge light on wheel portions having said light reflective surface for illumination and reflection therefrom, the discrete light transmission means consisting of plural separate sets, one set being

fixed to said vehicle, another set being operatively attached to said wheel, said sets being disposed at proximate ends thereof



in spaced relationship from one another and adapted to transmit light therebetween as said wheel rotates with respect to said vehicle.

4,430,693

ILLUMINATING DEVICE FOR UNDERGROUND MINING

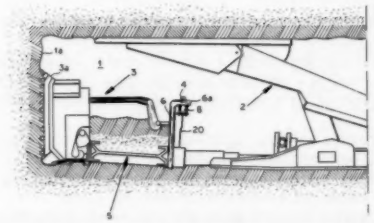
Martin Hamacher, Westerholter Strasse 791, 4352 Herten, Fed. Rep. of Germany

Filed Dec. 10, 1981, Ser. No. 329,511

Claims priority, application Fed. Rep. of Germany, Dec. 12, 1980, 3046834

Int. Cl.³ B60Q *1/00*

U.S. Cl. 362—61 **7 Claims**



1. In an excavating machine for underground mining having tool means for breaking clumps of solid matter of a mine face, and a wall member forming a rear boundary of a trough for the transportation of said lumps,

the combination therewith of a lamp carried on a rearwardly bent upper flange of said wall member, said lamp comprising a housing suspended from said flange behind said wall member, a light-transmissive vaulted cover rising from said housing and penetrating an aperture of said flange, and an electric light bulb inside said cover provided with a cable passing through said housing to an external power supply.

4,430,694

ARRANGEMENT FOR MOUNTING LIGHTING FIXTURES

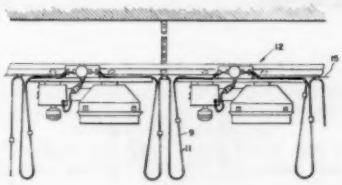
Harri Koivumäki, and Jouko Sinkkonen, both of Iittala, Finland, assignors to A. Ahlstrom Osakeyhtio, Noormarkku, Finland

Filed Dec. 2, 1981, Ser. No. 326,616

Int. Cl.³ F21V *21/14*

U.S. Cl. 362—250 **3 Claims**

1. An arrangement for mounting a plurality of lighting fixtures in a row, comprising a horizontal rail; a plurality of carriages supported by said rail for movement therealong, said lighting fixtures each being connected to a corresponding carriage for movement therewith along said rail; each of said carriages having a plurality of wheels that engage said horizontal rail to accomodate movement of the carriage therealong; a rope drive means connected with each of said carriages and operable to move same along said rail between respective operating positions in which the carriages are spaced apart by a given distance and servicing positions in which the carriages



are spaced apart by a lesser distance; said rope drive means including a first, endless rope, running between oppositely disposed drums, one of said drums having associated driving means, said first rope being connected to an endmost one of said carriages, and a second rope connected to each of said carriages and establishing the positions of said carriages along the rail when said endmost carriage is moved to its operating position.

4,430,695

VISUAL LANDING AIDS FOR AIRCRAFT

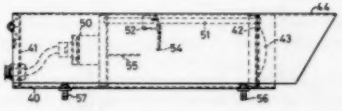
Robert M. Payne, and Christopher A. R. Haire, both of London, England, assignors to Research Engineers Limited, England

Filed Mar. 10, 1981, Ser. No. 242,319

Claims priority, application United Kingdom, Mar. 11, 1980, 8008191

Int. Cl.³ G01B *9/08*

U.S. Cl. 362—277 **14 Claims**



1. Apparatus for aligning the projector of a visual landing aid for aircraft, wherein that projector includes a filter whose position can be adjusted with respect to the aligning apparatus, the apparatus for aligning comprising:

a base including means for supporting a projector thereon for the projector to shine light toward a focusing means;

image receiving means for receiving an image projected by the projector and passing through said focusing means; the position of the image receiving means being adjustable with respect to the base for initially setting the apparatus;

said focusing means being located between the projector and the image receiving means for focusing the image from the projector onto the image receiving means only when the filter of the projector and the image receiving means of the aligning apparatus are at points conjugate to one another; and

means enabling observation of the image receiving means for ascertaining if the image of the filter is focused at the image receiving means.

4,430,696

LAMP MOUNTING MEANS

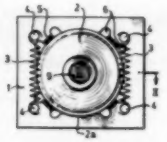
Ulrich Lemcke, Heidenheim, Fed. Rep. of Germany, assignor to Carl-Zeiss-Stiftung, Heidenheim, Fed. Rep. of Germany

Filed Jan. 31, 1983, Ser. No. 462,197

Claims priority, application Fed. Rep. of Germany, Feb. 5, 1982, 8203068[U]

Int. Cl.³ F21V 7/00

U.S. Cl. 362—306 11 Claims



1. Lamp supporting means comprising a lamp mount, a reflector rigidly connected to said lamp mount, an attachment part, and at least two coil springs which press said reflector against said attachment part, each of said coil springs having opposite ends held at fixed points on said attachment part to maintain each spring stretched in longitudinal tension with an intermediate portion of each spring pressing against said reflector in a direction to press said reflector against said attachment part.

4,430,697

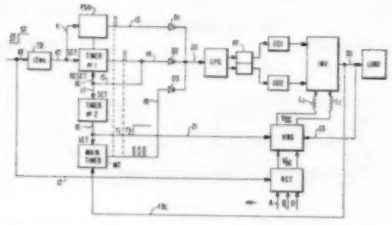
METHOD AND APPARATUS FOR STARTING A PARALLEL-TUNED CURRENT FED INVERTER

Harold A. Steinbruegge, and Chuck F. Der, both of Sykesville, Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 18, 1982, Ser. No. 359,550

Int. Cl.³ H02M 5/458

U.S. Cl. 363—49 6 Claims



1. A method of starting a high frequency (HF) thyristor-controlled inverter having a capacitor in series with a parallel compensated load under a DC voltage applied through an inductor element, comprising the steps of:

applying said DC voltage to said inductor element and said series capacitor by firing complementary thyristors of one pole of said inverter to conduct during a first time interval sufficient to establish a first predetermined minimum voltage across said series-capacitor, said first minimum voltage being sufficient to commutate said complementary thyristors of one pole;

firing complementary thyristors of the other pole of said inverter at the end of said first time interval to conduct during a second predetermined time interval sufficient to establish a second predetermined minimum voltage across said series-capacitor, said second minimum voltage being sufficient to commutate said complementary thyristors of the other pole; and

firing said thyristors of said inverter from at least the end of said second time interval in alternate succession at a predetermined free-running frequency of said HF inverter with increasing participation of said parallel compensated load.

4,430,698

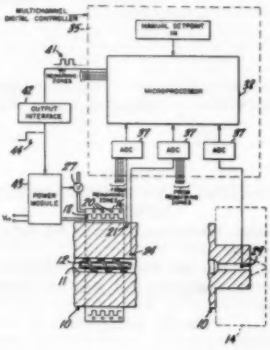
THREE-MODE PROCESS CONTROL

Holton E. Harris, Westport, Conn., assignor to Harrel, Incorporated, East Norwalk, Conn.

Filed Aug. 20, 1981, Ser. No. 294,726

Int. Cl.³ G05B 11/36, 11/42

U.S. Cl. 364—162 5 Claims



1. A method of controlling a process having a variable process parameter responsive to electrical control, including the steps of:

(a) measuring the variable process parameter and representing the process parameter as an electrical signal;

(b) electrically representing a predetermined set value of the parameters as a set point and comparing the measured parameter to the predetermined set value of the parameter;

(c) developing an error signal representative of the difference E between the measured parameter and the predetermined set value of the parameter by subtracting the measured parameter signal from the set point signal;

(d) multiplying the error signal by a constant K_1 to develop a signal representative of a proportional term K_1E;

(e) developing an integration signal representative of the integration of E with respect to time;

(f) multiplying the integration signal by a second constant K_2 to develop a signal representative of an integral term $K_2 \int Edt$;

(g) developing a derivative signal representative of the derivative of E with respect to time;

(h) comparing the sign of the derivative signal with the sign of the error signal;

(i) multiplying the derivative signal by a third constant K_3 to develop a signal representative of a derivative term $K_3(dE/dt)$, when the signs of the derivative and error signals are alike;

(j) adding the proportional, integral, and derivative term signals and applying the sum so produced as a process control signal, when the signs of the derivative and error signals are alike;

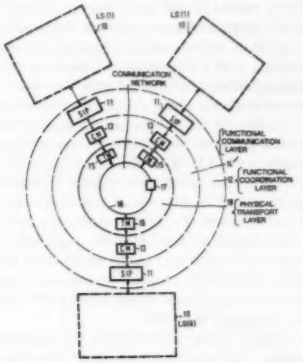
(k) replacing said derivative term signal with a reduced signal at least substantially less than $K_3(dE/dt)$, when the signs of the error and derivative signals are unlike; and

(l) adding the proportional term, integral term, and reduced signals and applying the sum so produced as the process control signal, when the signs of the error and derivative signals are unlike.

4,430,699
DISTRIBUTED DATA PROCESSING SYSTEM

Gerard Segarra, Jossigny, and Francois J. Phulpin, Saint Mande, both of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 17, 1981, Ser. No. 235,291
Claims priority, application France, Feb. 15, 1980, 80 03464
Int. Cl.³ G06F *13/00, 9/06*
U.S. Cl. 364—200 **11 Claims**

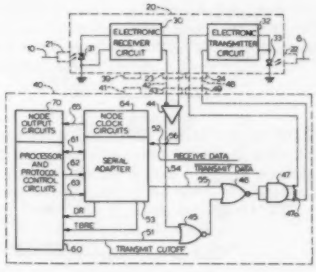


1. A distributed data processing system comprising a general communications network and a plurality of local systems, wherein the network is passive with respect to the self-contained operation of the respective local systems, and wherein each local system comprises at least one central processing unit, associated memory, at least one peripheral device and at least one residential process, local monitor means and a monitor extension module (**42**), wherein the control of the data processing in a local system is distributively effected by the local system itself, wherein each local system is interfaced to the network via its monitor extension module by means of a systems intercommunication processing means, the set of systems intercommunication processing means constituting a distributed coordination, communication, control, initialization and simulation means for the data processing system as a whole, each system intercommunication processing means being attached to the network via a communication module, the set of communication modules constituting a distributed control means for controlling communication protocols on the network for the data processing system as a whole, each communication module having sequencing means for controlling, in the communication protocols in a first sequence of steps, an addressed logical link from a source local system to a single destination local system and controlling in a second sequence of steps a broadcast logical link from a source local system to one or more destination local systems, said first and second sequences comprising conditionally executable logical link establishing steps, logical link maintaining steps and logical link terminating steps, said communication modules furthermore comprising information flow rate controlling means, presenting means for presenting the same general order of selected events at each local system, and error control means for detecting and thereupon recovering data communication errors, each communication module being plugged into the physical network by means of a transmission module, the set of transmission modules in combination with the physical network and a looping unit constituting a physical transport layer means, the physical network being a looped optical bus which is looped by said looping unit, wherein each transmission module comprises first control means for controlling parity errors, second control means for controlling synchronization between the transmission module itself and the transfer on the optical bus as presented, and bidirectional conversion means between electrical and optical signals, and wherein the looping unit has a first converting means for converting optical signals received from the bus to electrical signals, processing means for processing said electrical signals, and second converting means for converting processed electrical signals to optical signals for insertion into said optical bus, said processing means having encoding/decoding means for each transmission line of said bus, initializing means for initializing the transmission synchronization on the optical bus, and frame control means for controlling transmission and reception of data in a frame of a cycle of frames, the frame in question being allocated to one local system.

4,430,700
SYSTEM AND METHOD FOR COMMUNICATION BETWEEN NODES OF A CLOSED LOOP LOCAL COMMUNICATION PATH

George E. Chadima, Jr., and Joseph J. Kubler, both of Cedar Rapids, Iowa, assignors to Norand Corporation, Cedar Rapids, Iowa

Filed Jul. 31, 1981, Ser. No. 289,098
Int. Cl.³ G06F *15/16*; H04J *3/08*
U.S. Cl. 364—200 **9 Claims**



1. The method of effecting communication between nodes of a closed loop communication path including the nodes, wherein each node includes a transmission link switch which when in a first mode completes a link of the closed loop communication path and when in a second mode prevents an undelayed complete loop transmission, said method comprising

(a) at a node desiring to initiate communication as a bidding node,

(a1) monitoring the closed loop communication path for a gap in communication along the closed loop communication path of a defined time span,

(a2) and upon detection of such a communication gap shifting the transmission link switch at the bidding node to its second mode, and

(a3) transmitting a bid message in a given direction about the closed loop communications path from the bidding node,

(b) at each of the nonbidding nodes upon receipt of the bid message from a bidding node, insuring that the transmission link switch of such nonbidding node is in its first mode,

(c) at the bidding node monitoring the closed loop communication path for the bid message as an indication of a successful bid,

(d) upon a successful bid at a bidding node, transmitting a data message intended for at least one recipient node from the bidding node via the closed loop communication path while the transmission link switch of the bidding node is in the second mode,

(e) at a recipient node upon receipt of the data message

(e1) placing its transmission link switch in the second mode, and

(e2) transmitting a response via the closed loop communication path, and

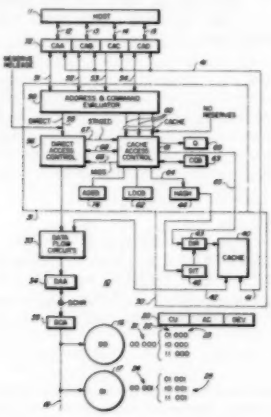
(f) at the bidding node shifting the transmission link switch to the first mode with a timing to prevent a communications gap of a predetermined time duration during reception of the response and thereafter upon receipt of the response placing the transmission link switch of the bidding node in said second mode.

4,430,701

METHOD AND APPARATUS FOR A HIERARCHICAL PAGING STORAGE SYSTEM

John H. Christian; Michael H. Hartung; Arthur H. Nolta; David G. Reed; Richard E. Rieck; Gerald E. Tayler, all of Pima County, and John S. Williams, Tucson, all of Ariz., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 3, 1981, Ser. No. 289,631
Int. Cl.³ G06F *13/00*
U.S. Cl. 364—200 **11 Claims**



5. A data-storage system having a plurality of addressable data-storage devices, a cache store for storing data at addressable locations which addressable locations are relatable to addressable data storage areas in said data-storage devices respectively, a control unit having a first connection to said data-storage devices and a second connection to said cache store and having adapter means for connecting said control unit to a using host unit which supplies device commands and addresses, data circuit means connected to said data-storage devices for transferring data signals to and from said data-storage devices and to said adapter for transferring data signals to and from said adapter;

the improvement including in combination:

address means in said control unit connected to said adapter means for receiving device addresses from said using host unit and including means for selecting a first address for each of said data-storage devices as a direct-access address and selecting any one of a plurality of additional addresses for each of said data-storage devices as a cache-access address, each of said addresses including a given address which uniquely identifies respective data-storage devices;

cache-access control means in said control unit connected to said address means to receive from said using host unit via said address means said additional addresses and being connected to said cache store for addressing said cache store in accordance with said received additional addresses;

means in said cache-access control for converting respective ones of said additional addresses to said given addresses for enabling access to said data-storage devices, respectively;

direct-access control means in said control unit and having a first input means connected to said address means for receiving from said using host unit via said address means said first addresses as a direct-access request and a second input means connected to said cache-access control means for receiving from said using host unit via said cache-access control means said given address included with said additional addresses to directly access said data-storage devices and being connected to said data circuit means for enabling data-signal transfers;

directory means in said cache-access control for responding to said given addresses received from said address means to generate access address signals for said cache store whereby said cache store is addressed by any one of a plurality of said additional addresses for a given unit of data of said respective data-storage devices;

search means in said cache access control coupled to said directory means for effectively searching said directory means to electrically indicate whether or not said cache store contains given data signals corresponding to data signals stored or storable at said given address;

read queue means of said cache-access control and coupled to said search means for being responsive to said search means indicating said cache store does not contain said given data signals to supply a request for said given data signals to said direct access control via said second input and storing an indication;

data-transfer means connected to said data circuit means to transfer data signals from said respective data-storage devices to said adapter means when said direct access control received said given address via said first input and to said cache store when said direct access control received said given address via said second input;

LDCB means in said control unit and connected to said cache-access control to indicate which of said additional addresses relates to each data transfer from said data storage devices to said cache store and connected to said address means for storing said received additional addresses for each of said received commands and device addresses such that the cache-access control can relate said read queue means to said received commands; and

independent data bus means extending between said adapter means and said cache store such that data transfer may be concurrent between said host unit and said cache store and between said host unit and any one of said disk storage apparatus.

4,430,702

NETWORK ACCESS DEVICE

Lowell H. Schiebe, Brooklyn Center; Bruce E. Russo, Minneapolis; Edward V. Urness, Shoreview, and William C. Hohn, St. Paul, all of Minn., assignors to Control Data Corporation, Minneapolis, Minn.

Continuation of Ser. No. 148,639, May 12, 1980, abandoned.
This application Mar. 2, 1983, Ser. No. 471,568
Int. Cl.³ G06F *15/16, 13/00*
U.S. Cl. 364—200 **18 Claims**

1. A network access device adapted to be connected to a data trunk for transmitting and receiving messages from said data trunk and for interconnecting various computer devices to said data trunk, said network access device comprised of:

a data set for receiving and transmitting data into and out of the network access device for connection to a data trunk,

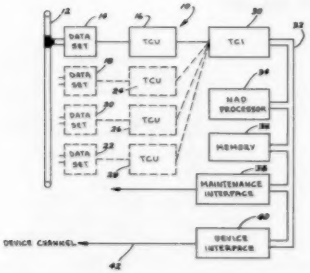
a trunk control unit connected to said data set for bi-directional communication into and out of said trunk and for transmitting at least first and second types of command messages and for receiving at least first and second types of response messages, a first type of command message being generated by said trunk control unit to indicate the status of said trunk control unit and a first type of response message being used by said trunk control unit to control the status of said trunk control unit,

a trunk control interface connected to said trunk control unit

and having means for connection with at least one additional trunk control unit for buffering of data transmitted to and received from said trunk control unit, said trunk control interface being responsive to control signals to respond to said trunk control unit in a selected function from a group of available functions, said available functions including receiving data from or transmitting data into said data trunk,

a network access device internal bus connected to said trunk control interface,

a network access device processor operating as a microcode sequencer and issuing output control signals connected with said internal bus for controlling said trunk control interface and trunk control unit by generating addressed status and interrupt control signals to said trunk control interface and to said trunk control unit, said processor generating at least some of said addressed control signals in response to signals received from said trunk control interface and said trunk control unit, said processor also



generating a second type of command message and receiving a second type of response message to control the network access device,

a trunk control unit input bus connected to said trunk control unit and said data set to receive signals from said data set and which is accessed by a number of tri-state drivers included in said trunk control unit each of which is controlled by said microcode sequencer logic and clock signals produced by said network access device processor and transferred by said trunk control interface to control access to said trunk control unit input bus at predetermined times according to said microcode sequence,

an internal network access device memory connected with said internal bus, and

a device interface connected with said internal bus for communication through said trunk control interface to said trunk control unit and to said data trunk through said data set and having an output device channel adapted for connection to an appropriate computer device.

4,430,703

ANTI-LOCK DEVICE FOR VEHICLE BRAKES

Eckart Saumweber, Gauting, and Klaus Schirmer, Mindelstetten, both of Fed. Rep. of Germany, assignors to Knorr-Bremse GmbH, Fed. Rep. of Germany

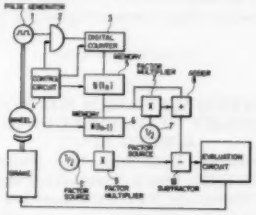
Filed Sep. 11, 1981, Ser. No. 301,398

Claims priority, application Fed. Rep. of Germany, Sep. 11, 1980, 3034227

Int. Cl.³ B60T *8/08*

U.S. Cl. 364—426 **6 Claims**

1. In an anti-lock device for vehicle brakes, the combination of means connected to a wheel of a vehicle for generating an output signal indicative of the wheel speed, a digital counter having a counter input connected to the output of said signal generating means, control circuit means connected to a control input of said counter for setting the counter to count during a predetermined time interval and locking the counter after the time interval and resetting the counter for a further time interval, a first memory connected to an output of said counter and to said control circuit means to store the count of the counter at times set by said control circuit means, a second memory connected to said control circuit means and to one of said counter and said first memory to store the count of the counter



of the next preceding time interval while said first memory stores the count of the immediate preceding time interval, and evaluating circuit means connected to both said first and second memories for producing a wheel speed value based on the two stored wheel speed counts of the immediate preceding and next preceding time intervals.

4,430,704

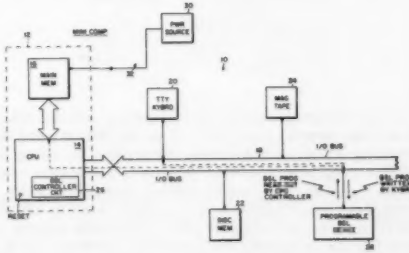
PROGRAMMABLE BOOTSTRAP LOADING SYSTEM

Robert E. Page, and Raymond B. Brackett, both of San Diego, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 21, 1980, Ser. No. 113,875

Int. Cl.³ G06F *9/24*

U.S. Cl. 364—200 **4 Claims**



1. A programmable bootstrap loader apparatus for loading software into the main memory of a computer system having an interconnected processor comprising:

nonvolatile storage memory means coupled to the main memory and having an electrically repeatedly alterable firmware structure for storing a set of instructions forming a bootstrap loader program that is not lost when power to the system is lost, said nonvolatile storage alterable memory means includes firmware means for providing a selected number of addressable data storage locations, and for enabling data storage at a particular one of said addressable locations to be selectively altered, while preventing loss of stored data when electric power is cut off from the alterable memory means;

computer processor-peripheral interface means coupled to the main memory for decoding instructions of said computer system, and for generating peripheral control signals; and

alterable memory access means coupled to said processor, to said processor-peripheral interface means to receive the peripheral control signals and to said nonvolatile storage

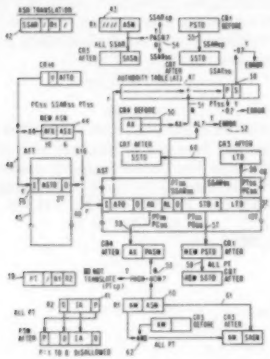
memory means for selectively altering discrete instructions of said stored bootstrap loader program in response to a discrete instruction provided by the processor and the peripheral control signals provided by the processor-peripheral interface means, said alterable memory access means further includes means for transferring a plurality of instructions including said bootstrap loader program from said alterable memory means into said main memory in response to a single instruction provided by said processor.

4,430,705

AUTHORIZATION MECHANISM FOR ESTABLISHING ADDRESSABILITY TO INFORMATION IN ANOTHER ADDRESS SPACE

James A. Cannavino, Hyde Park, N.Y.; Andrew R. Heller, Morgan Hill, Calif.; Morris Taradalsky, Poughkeepsie, and William S. Worley, Jr., Endicott, both of N.Y., assignors to International Business Machines Corp., Armonk, N.Y.

Filed May 23, 1980, Ser. No. 152,891
Int. Cl.[3] G06F 9/00, 9/46
U.S. Cl. 364—200 3 Claims



1. In a multiprogramming data processing system including (1) a main memory comprised of an addressing mechanism providing access to addressable information including data, problem programs, supervisor programs, and system control tables including addressable address translation tables for translating virtual addresses to real main memory addresses and (2) a processor including: (a) an instruction counter connected to the addressing mechanism for extracting program instructions from the main memory; (b) an address translation control register in the processor for storing a main memory address, transferrable by the processor to the main memory addressing mechanism, to provide access to a particular address translation table used for translating addresses of an associated program from virtual to real main memory addresses; (c) an address space number (ASN) control register for storing a plural-binary-bit present-ASN number providing a symbolic identifier of said particular address translation table addressed by said address translation control register; and (d) a processor control including program instruction decoding and execution control signal means, register, data path, and gate means connected and responsive to said execution control signal means, a machine implemented process in which said processor is controlled by said processor control in response to a program instruction to perform the method steps of:

transferring from main memory a new-ASN for storage in said ASN control register, and the address of an associated address translation table for storage in said address translation control register;

accessing from main memory a new-ASN-specified entry in a first system control table and transferring said entry to a register of said processor control, said particular entry comprising space switch authority control information including an authority control entry for each ASN that may be designated as a new-ASN indicating if the new-ASN can be used as a primary or secondary address space;

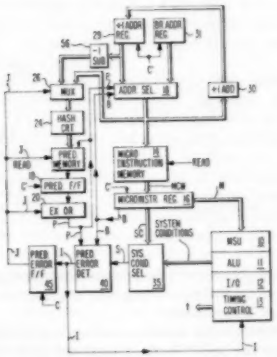
testing said space switch authority control information with an authorization index stored in said processor control, related to the present-ASN, for providing an interrupt signal in the processor if the program instruction associated with the present ASN is not authorized to establish use of the address translation table associated with the new-ASN.

4,430,706

BRANCH PREDICTION APPARATUS AND METHOD FOR A DATA PROCESSING SYSTEM

Duane B. Sand, Saratoga, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed Oct. 27, 1980, Ser. No. 201,315
Int. Cl.[3] G06F 9/42
U.S. Cl. 364—200 12 Claims



1. In a data processing system for performing data processing operations using an instruction flow containing at least one branch instruction, the combination comprising:

instruction storing means;

instruction executing means;

instruction accessing means for accessing an instruction from said instruction storing means for execution by said executing means;

prediction means coupled to said accessing means for providing a corresponding predicted next instruction indication for each branch instruction accessed from said storing means by said accessing means;

said accessing means being operative concurrently with the execution of a branch instruction by said executing means to access a predicted next instruction from said storing means based on the value of the predicted next instruction indication provided by said prediction means for the executing branch instruction;

sequencing control means for determining whether the predicted next instruction is correct based on the predicted next instruction indication provided for the executing branch instruction and at least one system condition provided during instruction execution;

said sequencing control means being operative in response to a determination that the predicted next instruction is correct for permitting the predicted next instruction to be executed by said executing means;

said sequencing control means being operative in response to a determination that the predicted next instruction is not correct for preventing execution of the predicted next instruction and instead causing said accessing means to

access the correct next instruction for execution by said executing means; and

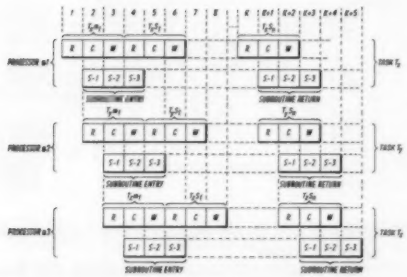
updating means responsive to a determination by said sequencing control means that a predicted next instruction is incorrect for automatically updating the corresponding predicted next instruction indication which will be provided by said prediction means when the corresponding branch instruction is next accessed by said accessing means.

4,430,707

MICROPROGRAMMED DIGITAL DATA PROCESSING SYSTEM EMPLOYING MULTI-PHASE SUBROUTINE CONTROL FOR CONCURRENTLY EXECUTING TASKS

Dongsung R. Kim, Laguna Hills, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed Mar. 5, 1981, Ser. No. 240,714
Int. Cl.³ G06F *9/38, 9/42, 9/46*
U.S. Cl. 364—200 **13 Claims**



1. In a microprogrammed data processing system providing for the concurrent execution of a plurality of tasks, the combination comprising:

program control means for generating a plurality of tasks, each task being performable by the execution of one or more task microinstructions;

microinstruction storage means for storing selectably addressable task microinstructions for use in performing said tasks;

task control means coupled to said program control means for activating a plurality of different tasks and for selectively addressing said microinstruction storage means in order to provide for the concurrent execution of a plurality of different activated tasks;

microinstruction execution means operating in a multiphased staged manner for concurrently executing a plurality of different task microinstructions selected from said microinstruction storage means and for producing microinstruction execution results for each executed microinstruction;

microinstruction sequencing control means responsive to microinstructions selected from said microinstruction storage means and to said microinstruction execution results for providing indications to said task control means for use in determining the selective addressing of said microinstruction storage means;

said microinstruction sequencing control means also being operative to provide a subroutine entry indication and a task identification indication when a task enters a subroutine and a subroutine return indication and a task identification indication when the task exits a subroutine; and

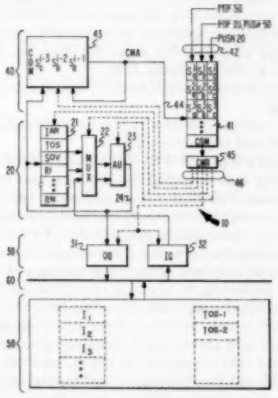
subroutine control means operating in a multi-phased staged manner in synchronism with said microinstruction execution means, said subroutine control means being responsive to said subroutine entry and return indications and to said task identification indications for determining and storing multiple levels of return addresses for subroutines entered by each task and for providing a corresponding return address to said sequencing control means when a task exits a subroutine.

4,430,708

DIGITAL COMPUTER FOR EXECUTING INSTRUCTIONS IN THREE TIME-MULTIPLEXED PORTIONS

David L. Isaman, La Jolla, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed May 22, 1981, Ser. No. 266,599
Int. Cl.³ G06F *9/28*
U.S. Cl. 364—200 **9 Claims**



1. A digital computer for executing sequential instructions $I_1, I_2, \ldots I_N$ of a single program in a time-multiplexed fashion, said digital computer being comprised of:

a memory means in which each of said sequential instructions is represented by respective first, second, and third sets of microcommands and where said first set of microcommands for any particular one of said sequential instructions must be executed before said second set of microcommands for that same instruction which in turn must be executed before said third set of microcommands for that same instruction;

means for reading from said memory means the third set of microcommands for instruction I_{i-3}, the second set of microcommands for instruction I_{i-2}, and the first set of microcommands for instruction I_{i-1}, where i is an integer; and

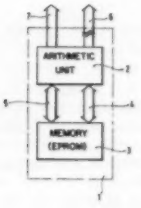
a control means for executing said third set of microcommands for instruction I_{i-3}, subsequently executing said second set of microcommands for instruction I_{i-2}, and subsequently executing said first set of microcommands for instruction I_{i-1};

said means for reading and said means for executing including means for performing their respective operations in a repetitive fashion with the subscript i being incremented each time by 1.

4,430,709
APPARATUS FOR SAFEGUARDING DATA ENTERED INTO A MICROPROCESSOR

Richard Schleupen, Ingersheim, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jul. 7, 1981, Ser. No. 281,170
Claims priority, application Fed. Rep. of Germany, Sep. 13, 1980, 3034581
Int. Cl.³ G06F 7/00
U.S. Cl. 364—200 **4 Claims**



1. In a single chip microprocessor having a non-volatile externally programmable memory unit (PROM) (3) having a plurality of storage locations; an arithmetic unit (2);

a plurality of externally accessible data bus lines (6) connected to the arithmetic unit;

a plurality of input-output lines (7) connected to the arithmetic unit,

data and address bus lines (4,5) interconnecting the arithmetic unit and the memory;

the memory unit (PROM) (3) including apparatus for safeguarding data stored in the memory unit (3) and to prevent undesired read-out of said data through the externally accessible data bus lines (6), comprising

at least one transmission gate (15–18) in the externally programmable memory unit (3) connected for data transmission on at least one of the data bus lines (6; 10–13) selectively permitting or blocking transmission of data through said externally accessible data bus lines (6);

one of said storage locations of the externally programmable memory unit (3) storing a blocking command;

and means (19) connected to the at least one transmission gate (15–18) for applying to said at least one transmission gate a transmission control signal from said one storage location upon addressing of said one storage location to thereby program said at least one gate to be blocked for blocking of data transmission through said at least one externally accessible data bus line (6; 1–13) to thus prevent undesired read-out of the data stored in the externally programmable memory unit.

4,430,710
SUBSYSTEM CONTROLLER

Robert D. Catiller, Garden Grove; Craig W. Harris, El Toro, and Ronald D. Mathews, Mission Viejo, all of Calif., assignors to Burroughs Corporation, Detroit, Mich.

Filed Aug. 24, 1981, Ser. No. 295,586
Int. Cl.³ G06F 3/00, 3/04
U.S. Cl. 364—200 **6 Claims**

1. In a data communications network where a network support processor connects to a first and second distribution control circuit and wherein said first distribution control circuit connects one or more host computers to said network support processor and said second distribution control circuit connects one or more line communication processors to said network support processor, and wherein one of said host computers generates instructions for data transfer between said host computer and a line communication processor having data-communication lines to remote terminals, the network support processor comprising:

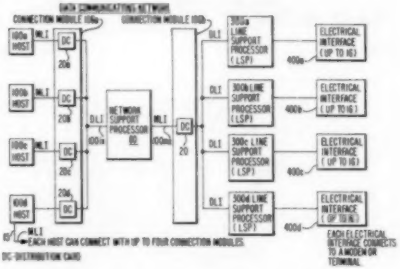
(a) an interface circuit for providing asynchronous communication to said first distribution control circuit having connection to said host computer and for providing synchronous communication to said second distribution control circuit having connection to said line communications processor;

(b) a shared memory, usable by a master processor controller means and said slave processor controller means, means for storing data undergoing transfer and for storing auxiliary programs for operation of said network support processor;

(c) a master controller circuit including:

(c1) master processor means for executing data transfer instructions received from said host computer and for controlling said interface circuit, a slave controller circuit, and a master memory control circuit;

(c2) said master memory control circuit for controlling



access to said shared memory means by said master processor means;

(c3) first multiple bus means for connecting said master processor means, said master memory control circuit, said shared memory means and said interface circuit;

(d) said slave controller circuit including:

(d1) a slave processor means, initiated by said master processor means, for processing data being transferred to/from said line communications processor and said shared memory means via said master processor means and said interface circuit;

(d2) a slave memory control circuit for controlling access to said shared memory means by said slave processor means;

(d3) second multiple bus means for connecting said slave processor means, said slave memory control circuit, and said shared memory means.

4,430,711
CENTRAL PROCESSING UNIT

Jared A. Anderson, Woodside; Robert V. Van Gelder, Berkeley; Lauren F. Yazolino, Oakland, and Jimmy E. Braun, Orange, all of Calif., assignors to Signetics Corporation, Sunnyvale, Calif.

Continuation of Ser. No. 154,632, May 30, 1980, abandoned.
This application Apr. 7, 1983, Ser. No. 482,818
Int. Cl.³ G06F 9/26
U.S. Cl. 364—200 **1 Claim**

1. A central processing unit comprising, in combination:

a control memory for storing a plurality of microprogram words each of which specifies the nature of a sub-operation performed by said processing unit and each of which comprises a plurality of control fields;

a microprogram control unit comprising, in combination,

first and second stack memories for respectively storing control counts and return addresses,

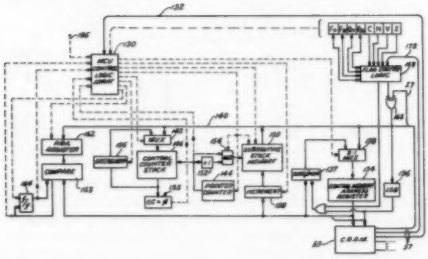
a stack pointer counter for addressing said stack memories,

means responsive to a first of said microprogram word

control fields for selectively incrementing, retaining, or decrementing the count held in said stack pointer counter,

means for supplying a control count from a second of said microprogram word control fields to the location in said first stack memory addressed by said stack pointer counter, and

means responsive to said first control field and to the control count in the addressed location in said first stack memory for supplying microprogram word addresses to said control memory, each microprogram word address being selectively derived from (1) the return address in said second stack memory addressed by said stack pointer counter, (2) a branch address from a second of said microprogram word control fields, or (3) a current microprogram word address previously supplied to said control memory;



a plurality of bipolar integrated circuit microprocessors cascaded to form an arithmetic and logic unit and a set of general registers, said arithmetic and logic unit have a control input connected to said control memory for selecting one of a plurality of predetermined operations under the control of a third one of said fields, said set of general registers having at least one address input;

an instruction register for storing an operation code and at least one general register address;

means connected between said instruction register and said microprogram control unit for translating said operation code into an initial control memory address; and

means for connecting said instruction register to said address input of said set of general registers to selectively specify at least one of said general registers in response to said at least one general register address.

4,430,712

ADAPTIVE DOMAIN PARTITIONING OF CACHE MEMORY SPACE

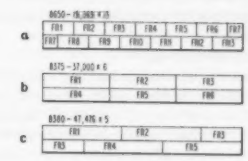
Richard L. Coulson; Ronald L. Blickenstaff; P. David Dodd; Robert J. Moreno, all of Boulder, and Dean P. Kinard, Longmont, all of Colo., assignors to Storage Technology Corporation, Louisville, Colo.

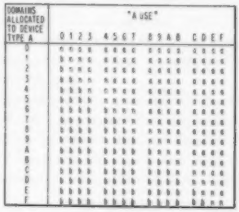
Filed Nov. 27, 1981, Ser. No. 325,351

Int. Cl.³ G06F *13/00*

U.S. Cl. 364—300 **6 Claims**

1. In a method of dividing a memory array into domains for the convenient storage of data, said data being received in plural differing predetermined amounts from plural classes of storage devices, said amounts being determined in accordance with physical characteristics of the respective class of storage devices, the improvement which comprises:





subdividing said array into domains of sizes which are substantially integral multiples of said plural predetermined amounts of data to be stored therein.

4,430,713

PLU-CODE CONTROLLED ELECTRONIC CASH REGISTER

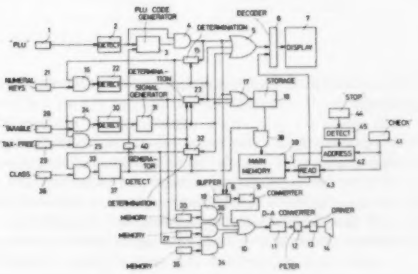
Hiroshi Nakatani; Masahide Ishida, both of Yamatokoriyama, and Hachizou Yamamoto, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed May 6, 1980, Ser. No. 147,165

Claims priority, application Japan, May 7, 1979, 54-56122; May 7, 1979, 54-56123

Int. Cl.³ G06F *15/20*

U.S. Cl. 364—405 **9 Claims**



1. In an electronic cash register employing a PLU (price-look-up) function, wherein merchandise information such as unit cost, taxation information and classification information is preset by an operator, a PLU code information preset system comprising:

first means for automatically developing PLU code signals in a progressive order;

a synthetic speech generation system for audibly instructing an operator of a necessary key operation for presetting the PLU code information associated with each PLU code signal;

a digital display unit for displaying the presently introduced PLU code information;

memory means for storing the introduced preset PLU code information;

addressing means for introducing the preset PLU code information into a predetermined memory section of the memory means;

a check request key; and

read-out means for reading out the PLU code information stored in said memory means in a progressive order in response to actuation of said check request key;

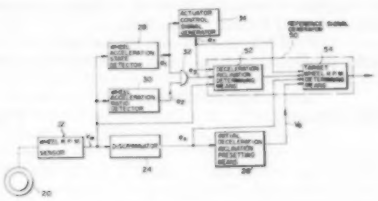
said synthetic speech generation system further including means for sequentially providing a synthetic speech sound in accordance with said PLU code information read out by said read-out means.

4,430,714

BRAKE CONTROL SYSTEM FOR AN AUTOMOTIVE VEHICLE

Toshiro Matsuda, and Minoru Honda, both of Yokohama, Japan, assignors to Nissan Motor Company, Limited, Kanagawa, Japan

Filed Nov. 20, 1980, Ser. No. 208,683
Claims priority, application Japan, Nov. 20, 1979, 54-149451
Int. Cl.[3] B60T *8/02*
U.S. Cl. 364—426 22 Claims



1. An anti-skid control system for an automotive vehicle comprising:

first means for detecting a wheel r.p.m. to produce a first signal having a value indicative of the wheel r.p.m.;

second means for calculating an acceleration rate of wheel r.p.m. operative during acceleration of the wheel r.p.m. due to release of brake pressure in an automotive hydraulic brake system for calculating said acceleration rate based on variation of said first signal value and for comparing said acceleration rate with a given threshold to produce a second signal when said acceleration rate equals or exceeds said given threshold;

third means, responsive to said second signal, for calculating a deceleration inclination in a next skid cycle based on a variation of said first signal value within an interval between occurrences of said second signal and on the length of said interval, and for calculating a deceleration r.p.m. based on said first signal value at an occurrence of said second signal and on said decelerating r.p.m., said third means producing a third signal representative of said target wheel r.p.m.; and

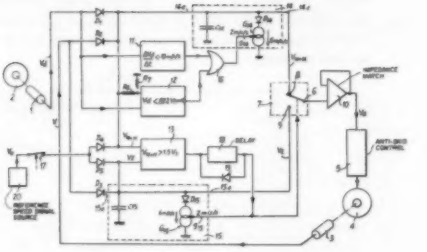
fourth means for comparing sequentially varying first signal values with said third signal value to release said brake pressure when said first signal value becomes equal to or less than said third signal value.

4,430,715

SYSTEM FOR BRAKING AN AIRCRAFT TAXIING ON THE GROUND

Pierre Gentet, Colomiers; Alain Y. Geoffroy, Tournefeuille, and Alain M. Caillebotte, Toulouse, all of France, assignors to Societe Nationale Industrielle Aerospatiale, Paris, France

Filed Sep. 3, 1981, Ser. No. 298,928
Claims priority, application France, Sep. 30, 1980, 80 20889
Int. Cl.[3] B60T *8/02*
U.S. Cl. 364—426 10 Claims

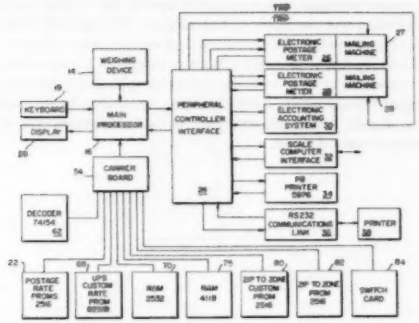


1. System for braking an aircraft comprising, on the one hand, a non-skid device which receives speed information from at least one first detector coupled to at least one non-braked wheel of said aircraft and furnishing an electrical magnitude representative of the speed thereof and which avoids locking of the braked wheels by servo-control of the slide and, on the other hand, a correction device disposed between said speed detector and said non-skid device and sensitive to at least one deceleration threshold representative of the hydro-planing of said non-braked wheel, wherein it further comprises at least one second speed detector coupled to at least one braked wheel and furnishing an electrical magnitude representative of the speed thereof, as well as a source furnishing an electrical reference magnitude corresponding to a reference speed of the aircraft just before landing and wherein said correction device comprises a selector of which the output is connected to said non-skid device and of which the two inputs are respectively connected to the outputs of a first or a second memory adapted to store an electrical magnitude and to reproduce it at two different rates of decrementation by action on a control member, the input of said first memory being connected to the first and to the second speed detector and to said source and its control member being connected to the output of two comparators which cause said first memory to pass from its fast rate to its slow rate if the electrical magnitude at the output of the first detector is less than a predetermined fraction of the value of the electrical magnitude at the output of said first memory or if the variation of the electrical magnitude of the first detector is less than said threshold representative of hydro-planing, whilst the input of said second memory is connected to the second speed detector as well as to said source and its control member is connected to the output of a third comparator, capable, when the ratio of the electrical magnitudes at the outputs of said first and second memories is higher than a threshold representative of a burst wheel, of simultaneously causing said second memory to pass from its fast rate to its slow rate and said selector to pass from its normal position, for which it connects the output of the first memory to the non-skid device, to its temporary position, for which it connects the output of the second memory to said non-skid device.

4,430,716
POSTAGE VALUE DETERMINING SCALE WITH EXPANDABLE MEMORY PORT

Daniel F. Dlugos, Huntington, and Flavio M. Manduley, Woodbury, both of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Jun. 26, 1981, Ser. No. 277,779
Int. Cl.³ G01G *19/40*
U.S. Cl. 364—466 **14 Claims**

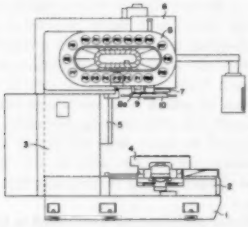


1. In a postage value determining system comprising a processor, weighing means for introducing article weight information, means for introducing postage value related information, and rate memory means for storing postage rate information, the processor receiving the weight information and the postage value related information, the processor retrieving the postage rate information from the memory means and generating a postage value for an article, the improvement comprising memory port means, the rate memory means being selectively engageable directly with the port means, memory carrier means, the memory carrier means being selectively engageable with the port means, a plurality of postage memory means, the plurality including the rate memory means, the plurality of postage memory means being interconnected to the carrier means, the processor retrieving the postage rate information through the memory carrier means, the memory carrier means including means for selective accessing of any of the postage memory means, whereby the postage value determining system is augmented with additional memories for providing optional functional features.

4,430,717
MACHINE TOOL

Masaki Senda, Komaki, and Takashi Mizoguchi, Kasugai, both of Japan, assignors to Okuma Howa Kikai Kabushiki Kaisha, Kounan, Japan

Filed Aug. 6, 1981, Ser. No. 290,771
Claims priority, application Japan, Aug. 15, 1980, 55-112847
Int. Cl.³ G06F *15/46*
U.S. Cl. 364—474 **1 Claim**



1. A numerically-controlled tool machine including a tool magazine having a plurality of selectively indexed storage locations for storing respective of a plurality of tools, a tool exchanging arm turnable and axially movable between said magazine and a spindle rotatably coupled to a spindle head to exchange a tool, and having a function of optionally setting and storing tool numbers in memory means in control means according to an operation program, comprising:

display means for displaying for each of said storage locations the tool number of the respective tool stored therein;

means for selectively displacing at least one of said tools from one storage location to another in accordance with a tool selection or exchange designated by said operation program;

means for automatically shifting positions where the respective tool number of said at least one displaced tool is stored in said memory means in correspondence with selective displacement of said at least one tool to another storage location; and

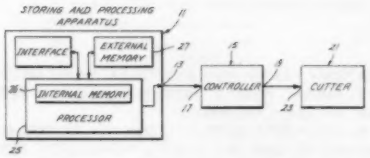
said display means including means for displaying for each storage location the respective tool number of the tool stored therein, including the tool number shifted in position in said memory means in correspondence with the storage location to which said at least one of said tools is displaced; .

whereby the tool numbers displayed by said display means are changed in association with the tool displacement.

4,430,718
IMPLEMENTATION SYSTEM

Philip A. Hendren, 2105 Scenic Dr., Austin, Tex. 78703

Filed Mar. 2, 1981, Ser. No. 239,463
Int. Cl.³ G06F *15/46*; B26D *1/10*
U.S. Cl. 364—475 **13 Claims**



1. A system for converting design information into models by sculpturing a workpiece having a low modulus of elasticity, comprising:

a graphic digitizer in electrical communication and cooperating with a microprocessor, having a processor output, for substantially immediate digitizing of a two-dimensional design drawn on a surface of said digitizer, storing said digitized designs for later recall, and transmitting said digitized designs via said processor output upon command from an external source;

controller means, having a controller input connected to said processor output, and a controller output for converting digital information received at said controller input into electrical signals, said electrical signals being provided at said controller output and having characteristics which are a function of the information received at said controller input; and

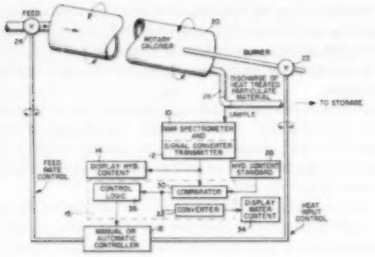
cutter means, having a cutter input connected to said controller output, for sculpturing said workpiece into a three-dimensional form in accordance with the electrical signals provided at said cutter input, said cutter means including a hot-wire for cutting through said workpiece,

whereby two-dimensional designs are immediately reproduced in model form for examination and further refinement and for mass reproduction of an acceptable design.

4,430,719
CALCINATION CONTROL SYSTEM

Robert M. Pearson, Pleasanton, Calif., assignor to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Filed Nov. 3, 1981, Ser. No. 317,972
Int. Cl.³ G01N *24/08*
U.S. Cl. 364—503 **6 Claims**

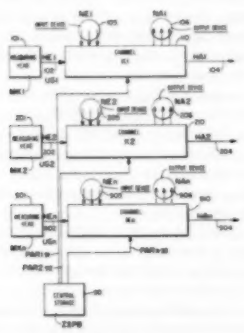


1. A system for the control of residual proton content of heat-treated, hydrogen-containing particulate materials by adjusting the heat-input to the heat-treatment process or by varying the feed rate of the particulate material to the heat-treatment process which comprises a nuclear magnetic resonance (nmr) spectrometer means capable of measuring the proton content of the heat-treated particulate material by producing a magnetic field and thus generating a signal proportional to the residual proton content of the heat-treated particulate material; means to convert the generated signal to readable measured units corresponding to the residual hydrogen content of the heat-treated particulate material, means for comparing the measured units to preset units of desired hydrogen content, and associated control means for issuing commands to the heat-treatment process for the adjustment of the heat-input or the particulate material feed rate.

4,430,720
CLEANING YARNS AND ASSESSING YARN DEFECTS

Peter F. Aemmer, Wettswil, Switzerland, assignor to Zellweger Uster AG, Uster, Switzerland

PCT No. PCT/CH79/00159, § 371 Date Nov. 10, 1980, § 102(e) Date Nov. 10, 1980, PCT Pub. No. WO80/01955, PCT Pub. Date Sep. 18, 1980
PCT Filed Dec. 12, 1979, Ser. No. 212,708
Claims priority, application Switzerland, Mar. 16, 1979, 2491/79
Int. Cl.³ G06F *15/46*
U.S. Cl. 364—552 **12 Claims**

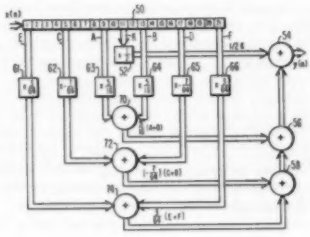


9. A method of assessing yarn defects using digital technology comprising the steps of generating analog signals proportional to the running yarn cross section or diameter by means of one or more sensors; converting said analog signals to digital signals representing periodic samples of said yarn cross section or diameter on a linear scale; converting said digital signals from a linear scale to a logarithmic scale; storing the converted logarithmic digital signals; comparing said stored converted logarithmic digital signals to a plurality of selected defect tolerance limits which form successive tolerance zones outside of a given minimum tolerance zone and to the digital signal representing the previous stored sample; storing only those digital signals which fall outside said given minimum tolerance zone and represent an entry into or an exit from a given tolerance zone on the basis of the previous sample; and generating a trigger command for yarn cleaning in response to selected digital signals which are identified in said comparing step as relating to yarn defects.

4,430,721
ARITHMETIC CIRCUITS FOR DIGITAL FILTERS

Alfonse Acampora, Staten Island, N.Y., assignor to RCA Corporation, New York, N.Y.

Filed Aug. 6, 1981, Ser. No. 290,500
Int. Cl.³ G06F *15/31*
U.S. Cl. 364—724 **11 Claims**



1. A digital filter for processing a binary signal, said filter including delay stages

for producing delayed replicas of said binary signal at a plurality of output taps, said filter further comprising:

a plurality of weighting function circuits having inputs coupled to respective ones of said output taps for producing weighted binary signals;

a plurality of adders coupled in a ladder network to additively and subtractively combine said weighted signals to produce a filtered digital output signal, said additively combining adders each being responsive to two of said weighted signals in binary form for producing digital sum signals in binary form, and said subtractively combining adders each being responsive to two of said weighted signals, one of which is in two's complement form, for producing digital difference signals; and

means, coupled in series with the inputs of each of said subtractively combining adders, for converting the weighted signals applied thereto to offset two's complement form:

whereby digital additions are performed in binary form and digital subtractions are performed in offset two's complement form.

4,430,722
METHOD AND ARRANGEMENT FOR THE CORRELATION OF TWO SIGNALS

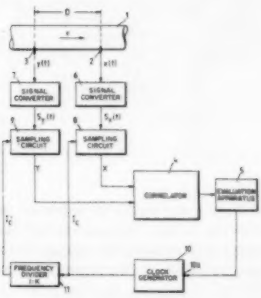
Robert Massen, Kämpfenstrasse 39, 7760 Radolfzell 18; Jürgen Merkel, Neue Strasse 29C, 7867 Maulburg, and Klaus-Peter Lindner, Gartenstrasse 6, 7881 Schwörstadt, all of Fed. Rep. of Germany

Filed Sep. 26, 1980, Ser. No. 191,351

Claims priority, application Fed. Rep. of Germany, Oct. 3, 1979, 2940158; Aug. 12, 1980, 3030438

Int. Cl.³ G06F *15/336*

U.S. Cl. 364—728 **32 Claims**



1. Method for correlating first and second signals wherein mutually time-displaced sampling values of the two signals are multiplied together and to determine a discrete value of the correlation function the average value of the multiplication results corresponding to the same time displacement is formed, said method comprising: sampling said second signal at a predetermined sampling frequency, sampling said first signal with a sampling frequency which is a multiple of the sampling frequency of said second signal, storing a number of the respective last sampling values of the more slowly sampled signal, multiplying each sampling value of the more rapidly sampled signal simultaneously by all the stored sampling values of the more slowly sampled signal; and separately summing respective multiplication results corresponding to the equal time displacement between the multiplied sampling values.

4,430,723
SEMICONDUCTOR MATRIX OPERATION DEVICE

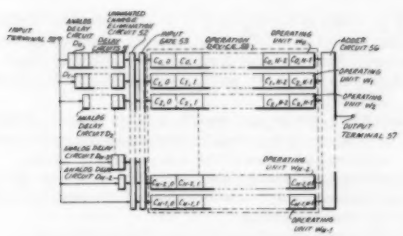
Kunihiro Tanikawa, Akashi; Yuichiro Ito, Kobe, and Mitsuo Ishii, Yokohama, all of Japan

Continuation of Ser. No. 71,270, Aug. 30, 1979, abandoned, which is a continuation of Ser. No. 879,879, Feb. 2, 1978, abandoned. This application Jun. 8, 1981, Ser. No. 271,587

Claims priority, application Japan, Feb. 24, 1977, 52-20106

Int. Cl.³ G06G *7/16*

U.S. Cl. 364—862 **5 Claims**



1. A semiconductor signal transforming device for matrix operating a signal of analog type having a continuous amplitude, said semiconductor signal transforming device including an operation device having an input and a plurality of multistage charge coupled devices arranged in parallel with the same transfer direction, each of said charge coupled devices having split electrodes for providing a weighting coefficient to respective stages so as to act as an operating unit, an input circuit connected to the input of the operation device, said input circuit having a plurality of analog delay circuits each having a final stage and connected to a corresponding charge coupled device of said operation device, said input circuit providing sampled data of an input signal to be transformed as a simultaneous input to all said delay circuits, the final stage of each of said delay circuits having a charge which is the sampled data of said input signal at respectively different instants, an output circuit connected to an output of said operation device for receiving an output signal operated in the respective charge coupled device for operation, wherein each of said analog delay circuits having another type of charge coupled device with a different number of transfer stages, and each of said charge coupled devices for delaying are respectively coupled at said final stages of said delay circuits to said charge coupled devices for operation with relation to the two transfer directions of the two types of charge coupled devices and become of the same direction.

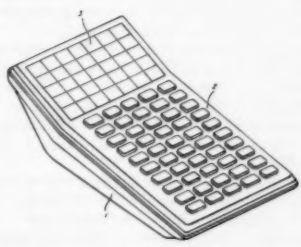
4,430,724
MEMORY INTERFACE SYSTEM HAVING COMBINED COMMAND, ADDRESS AND DATA BUSS

Stephen P. Hamilton, Midland; Arthur C. Hunter, and Kenneth A. Lies, both of Lubbock, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jun. 26, 1980, Ser. No. 163,024

Int. Cl.³ G06F *13/06*

U.S. Cl. 364—900 **7 Claims**



1. A memory interface system comprising:

a bus means for providing signal transfer paths with a minimum number of conductors;

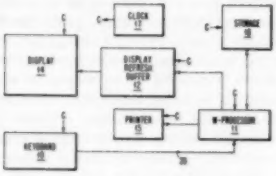
a processor means coupled to said bus means for transmitting or receiving command signals, address signals and data signals on common conductors of said bus means, such signals being in a command sequence whereby each command sequence begins with a command signal on said common conductors followed sequentially by address or data signals also on said common conductors; and

at least one memory means coupled to said bus means, said memory means including a memory array having a plurality of multibit data words stored at memory locations corresponding to said address signals and a command decode means coupled to said common conductors of said bus means for distinguishing command signals from address signals and data signals, for decoding such distinguished command signals and for causing said memory array to transmit or receive data or address signals to or from said procesor means via said common conductors of said bus means in accordance with said decoded command signal.

4,430,725
METHOD FOR DISPLAYING SOURCE AND DESTINATION FILE HEADERS FOR EASY COMPARISON OF PROPOSED HEADER CHANGES

Jo A. Elliott; John W. McInroy, and Paul D. Waldo, all of Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 18, 1981, Ser. No. 264,270
Int. Cl.³ G06F *3/153*
U.S. Cl. 364—900 **7 Claims**



1. In an interactive text processing system having a keyboard, a display device, a memory, and a processing unit for processing conventional text data and spatially related data that is stored in said memory in a vector format and in which one or more multi-field records of spatially related vector formatted data of a source file stored in said memory are transferred by said system to a destination file stored in said memory with a different field arrangement defined in accordance with text editing operations performed on the header record of said source file and the header record of said destination file by an operator interacting with said keyboard and said display unit, an improved method of displaying to said operator, after completion of said text editing operations and prior to transferring said one or more multi-field records from said source file to said destination file, the difference in said field arrangements of said header record of said source file and said header record of said destination file, said method comprising:

(a) displaying to said operator on said display device one display frame containing said header record of said source file as stored in said memory and said header record of said destination file as stored in said memory;

(b) determining which fields in said header record of said source file are common to the header record of said destination file;

(c) storing in said memory an indication for each said field that is common to both said headers to control the type of visual treatment afforded to said fields; and

(d) controlling said display device to cause said common fields to be displayed differently than said fields which are not common in accordance with said stored indication so that said common fields involved in the transfer from said source file to said destination file are readily distinguishable to said operator from any other said fields in said header records prior to said transfer.

4,430,726
DICTATION/TRANSCRIPTION METHOD AND ARRANGEMENT

Leonard R. Kasday, Plainsboro, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jun. 18, 1981, Ser. No. 274,771
Int. Cl.³ G06F *3/153*
U.S. Cl. 364—900 **15 Claims**

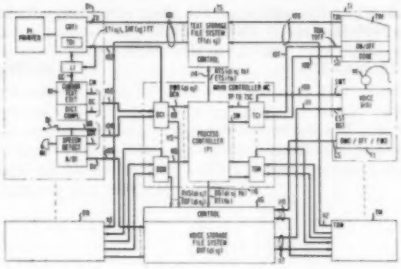
1. A method of operating a dictation transcribing system characterized by the steps of:

a. receiving voice dictation signals representing one or more spoken words from a dictation terminal,

b. segmenting said dictation signals into time sequential voice dictation segments each consisting of one or more words,

c. checking and storing in a done time table entries identifying the time when each transcriber terminal was available to receive transcribing,

d. assigning and transmitting each sequential voice dictation segment to one of a plurality of transcriber terminals by selecting a transcriber terminal having the earliest time entry in said done time table,



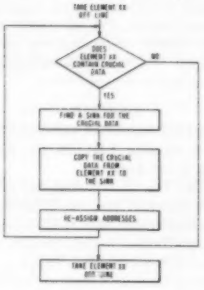
e. transcribing voice dictation segments into transcription signals at the assigned transcriber terminal and

f. assembling the transcription signals from the transcriber terminals according to the segment assignments.

4,430,727
STORAGE ELEMENT RECONFIGURATION

Brian B. Moore, Poughkeepsie; John T. Rodell, Wappingers Falls; Arthur J. Sutton, Cold Spring, and Jeff D. Vowell, Poughkeepsie, all of N.Y., assignors to International Business Machines Corp., Armonk, N.Y.

Filed Nov. 10, 1981, Ser. No. 319,869
Int. Cl.³ G06F *11/00*
U.S. Cl. 364—900 **9 Claims**


TAKE ELEMENT XX OFF LINE
DOES ELEMENT XX CONTAIN CRUCIAL DATA
NO
YES
FIND A SPARE FOR THE CRUCIAL DATA
COPY THE CRUCIAL DATA FROM ELEMENT XX TO THE SPARE
RE-ASSIGN ADDRESSES
TAKE ELEMENT XX OFF LINE

1. In a data processing system in which data are scattered among various physical storage elements, a method for taking a storage element off line comprising the following steps:

identifying the specific physical storage element that is to be taken off line;

identifying, within said specific storage element, portions thereof containing crucial material that is essential to the continued operation of the data processing system;

identifying, in storage elements other than said specific storage element, a new area that is large enough to hold said crucial material;

copying said crucial material to said new area; and

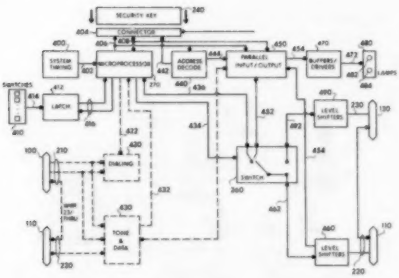
re-assigning addresses so that references to said crucial material will properly result in accesses of said crucial material from said new area.

4,430,728

COMPUTER TERMINAL SECURITY SYSTEM

James E. Beitel, Englewood; Charles R. Bruce, Littleton; Gary R. Cook, Denver, all of Colo.; Charles F. Mosier, Jr., and Edward L. Sartore, both of Findlay, Ohio, assignors to Marathon Oil Company, Findlay, Ohio

Filed Dec. 29, 1981, Ser. No. 335,972
Int. Cl.³ G05F 15/16, 3/04; H04L 9/00; H04M 11/00
U.S. Cl. 364—900 3 Claims



1. An improved computer terminal security system interconnected with at least one terminal computer having a calling telephone and a calling modem at a remote location and further interconnected with a host computer having a called telephone connectable to said calling telephone over phone lines and a called modem, a plurality of first removable memory modules, a first security circuit connected to said at least one terminal computer, a second security circuit connected to said host computer, and said first security circuit being powered and operative only when any one of said first removable memory modules are inserted, said improved computer terminal security system comprising:

said first removable memory module containing the secret telephone number of said called telephone, a secret user identification code, and remote sequencing program instructions, said first memory module being further capable of being selectively erased and reprogrammed to incorporate different telephone numbers, user identification codes and remote sequencing program instructions in the event of a loss of secrecy,

said first security circuit being further connected to said calling modem and to said calling telephone, said first security circuit comprising:

(a) first receiving means for selectively receiving said first memory module,

(b) a switch,

(c) first processing means connected to said first receiving means and to said switch and responsive to the activation of the switch for causing the first processing means to retrieve said remote sequencing program instructions, said secret user identification code, and said secret called telephone number from said first memory module, and for executing said sequencing program instructions for generating dialing means, delivering means, and first interconnecting means control signals,

(d) dialing means connected to said calling telephone and receptive of said dialing means control signals and secret called telephone number from said first processing means for automatically dialing said called telephone through said calling telephone and over said phone lines,

(e) delivering means connected to said calling telephone and receptive of said delivering means control signals and said secret user identification code from said first processing means for delivering said secret user identification code over said phone lines to said called telephone, and

(f) first interconnecting means connected to said first processing means, to said calling modem, and to said terminal computer and receptive of said first interconnecting control signals for selectively interconnecting said terminal computer to said calling modem, said calling modem being connected to said calling telephone,

a second removable, erasable and programmable memory module for containing a plurality of secret user identification codes and host sequencing program instructions, said second memory module capable of being selectively erased to incorporate different user identification codes and host sequencing program instructions in the event of said loss of secrecy, and

said second security circuit further being connected to said called modem, and to said called telephone, said second security circuit comprising:

(a) second receiving means for selectively receiving said second memory module, said second security circuit being operable only when said second removable memory module is inserted,

(b) second processing means connected to said second receiving means and receptive of said host sequencing program instructions and of said plurality of secret user identification codes for executing said host sequencing program instructions,

(c) answering means connected to said called telephone and to said second processing means for automatically answering said calling telephone, said second processing means being further receptive of said delivered user identification code from said delivering means for comparing said delivered user identification code to the codes in said plurality of secret user identification codes and said second processing means being further capable of generating an acknowledgment signal when said delivered user identification code matches one of said plurality of user identification codes,

(d) sending means connected to said called telephone and receptive of said acknowledgment signal from said second processing means for sending said acknowledgment signal through said called telephone over said phone lines to said first interconnecting means, said first interconnecting means upon receipt of said acknowledgment signal becoming activated to selectively interconnect said terminal computer to said calling modem, and

(e) second interconnecting means connected to said second processing means, to said called modem, and to said host computer for becoming activated and interconnecting said host computer with said called modem only in response to said sending of said acknowledgment signal, said called modem being connected to said called telephone so that said host computer and said terminal computer can communicate over said phone lines, said host computer being accessible by said terminal only after said first and second interconnecting means become activated.

4,430,729

SERIES RESONANT DRIVE CIRCUIT FOR MAGNETIC BUBBLE MEMORY

Takashi Toyooka, Sayama; Hirokazu Aoki, Hachioiji; Mamoru Sugie, Sayama, and Shigeru Yoshizawa, Tokorozawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 8, 1982, Ser. No. 416,043
Claims priority, application Japan, Sep. 9, 1981, 56-140977
Int. Cl.³ G11C 19/08
U.S. Cl. 365—6 4 Claims

1. A series resonant drive circuit for a magnetic bubble memory, comprising:

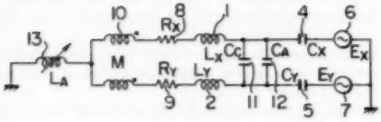
(a) a magnetic bubble memory chip in which magnetic bubbles are driven in accordance with a rotating magnetic field;

(b) X- and Y-coils arranged orthogonally to each other to

generate said rotating magnetic field in a plane of said magnetic bubble memory chip;

(c) resonance capacitors each connected in series with a corresponding one of said X- and Y-coils to form a series resonance circuit with the corresponding one of said X- and Y-coils at a frequency of said rotating magnetic field;

(d) power supplies each connected to a corresponding one of said resonance circuits to supply a cyclic wave current



containing only an A.C. component to the corresponding one of said resonance circuits; and

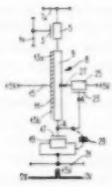
(e) reactance means connected to said resonance circuits to compensate a mutual inducatnce due to the inductive coupling between said X- and Y-coils and a capacitance due to the capacitive coupling between said X- and Y-coils, said reactance means having a temperature coefficient selected to compensate the temperature coefficient of said mutual inductance and said capacitance.

4,430,730

FET MEMORY WITH REFRESH

Paul C. Tien, Redondo Beach, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 29, 1981, Ser. No. 316,159
Int. Cl.³ G11C *11/24*
U.S. Cl. 365—149 **24 Claims**



1. A memory cell adapted to store data as a capacitor and to restore charge periodically to preserve stored data comprising:

a first, enhancement-mode FET;

a second, depletion-mode FET having one side of its channel connected to the channel of said first FET, at least said second FET having an area to store said data;

a gate-controlled capacitor with its gate connected to the other side of the channel of said first FET, said capacitor being operative as a capacitor when gated on and being substantially non-conductive of current when gated off;

means to connect a source of periodic pulses to the side of said capacitor opposite its gate;

switch means operable by the potential at the gate of said gate-controlled capacitor and connected to the channel of said second FET, and

means to connect an operating potential to the gate of said first FET;

means to connect an operating potential to the gate of said second FET, and

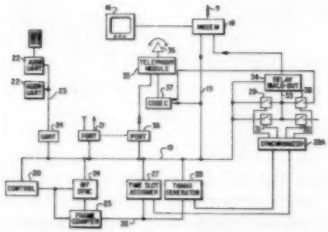
means to connect an operating potential to said switch means such that operation of said switch means connects the operating potential connected to said switch means through said switch means to the channel of said second FET.

4,430,731

VIDEO AND DATA DISTRIBUTION MODULE WITH SUBSCRIBER TERMINAL

Irving Gimple, and William Rodman, both of Montreal, Canada, assignors to The Manitoba Telephone System, Winnipeg, Canada

Filed Apr. 29, 1981, Ser. No. 258,746
Claims priority, application Canada, Apr. 30, 1980, 350915
Int. Cl.³ H04J *3/00*; H04N *7/14*
U.S. Cl. 370—30 **27 Claims**



1. A subscriber communication terminal comprising:

(a) a modem for receiving incoming data signals from an incoming carrier having a first frequency, for deriving a bit clock signal from the incoming carrier, for generating an outgoing carrier from the incoming carrier and for transmitting outgoing data signals on the outgoing carrier,

(b) the incoming data signals being in the form of frames of data bits, each frame being divided into channels of a predetermined number of bits and ending with an extra frame bit, the frame bits form a predetermined pattern, control signals being contained in a predetermined channel,

(c) a first shift register connected in a circuit with the modem for receiving the data signals,

(d) means for enabling the shift register during the time of the predetermined channel whereby the control signals are read into and stored in the shift register during the time of the predetermined channel,

(e) a bus system for receiving the control signals from the shift register,

(f) means for receiving the bit clock signal and for generating frame and channel count timing signals therefrom,

(g) a second shift register connected to the bus system for receiving outgoing data signals,

(h) a circuit including a switch for carrying the outgoing data signals to the modem for modulation on the outgoing carrier,

(i) a time slot generator adapted to receive the timing signals for generating control signals for said switch and for the second shift register, for controlling the time of application of said outgoing data signals in a predetermined outgoing channel,

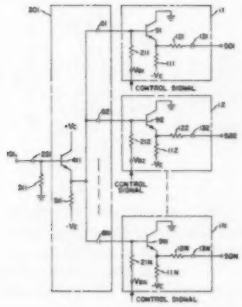
(j) port means connected to the bus system for connecting to at least one of data generating and receiving apparatus, and

(k) a microprocessor connected to the bus system for receiving the incoming data signals, generating control signals, reading signals from the port means and writing signals to the port means, and generating said outgoing data signals.

4,430,732
SWITCH MATRIX APPARATUS FOR SATELLITE-SWITCHED TDMA SYSTEM OR THE LIKE

Ryokichi Saga, and Yukio Takimoto, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Jan. 21, 1981, Ser. No. 226,793
Claims priority, application Japan, Jan. 23, 1980, 55-6465
Int. Cl.[3] H04J *15/00;* H04B *7/185*
U.S. Cl. 370—54 16 Claims



1. A switch matrix comprising:

M number (M is a positive integer) of distributing means for distributing an input signal applied thereto into N signals (N is positive integer);

N combining means for combining the respective distributed outputs of said M distributing means into signals, said N combining means respectively including a current combining means comprising resistances and a low input impedance circuit arranged to be coupled to the output of said current combining means; and

M×N switching circuit means connected respectively between the outputs of said M distributing means and the inputs of said N combining means for selectively supplying the outputs of said M distributing means to said N combining means, each of said M×N switching circuit means having an emitter follower means with a high input impedance with respect to the impedance of the previous circuit of said M×N switching circuit means and with a low output impedance with respect to the following circuit of said M×N switching circuit means.

4,430,733
SWITCHING OF DIGITAL SIGNALS

John H. M. Hardy, The Hague, Netherlands; Robert E. Barrett, Ipswich; Anthony R. Allwood, Woodbridge; Garth I. Riley, Ipswich; John Hovell, Ipswich; Donald W. Smith, Ipswich; Arthur R. Potter, Saxmundham, and Ian W. Lowrie, Ipswich, all of England, assignors to Post Office, London, England

Filed Nov. 7, 1978, Ser. No. 959,181
Claims priority, application United Kingdom, Nov. 7, 1977, 46296/77
Int. Cl.[3] H04J *3/12;* H04Q *11/04*
U.S. Cl. 370—110.1 24 Claims

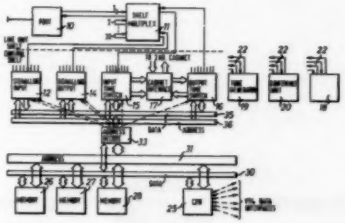
1. A digital switching device for switching digital signals under the control of a central control unit, said device comprising:

a first stage adapted for connection to a plurality of ports including multiplexing means for multiplexing together signals received from said ports including both data signals and signalling information from each of said ports, means for separating data signals and signalling information into separate respective multiplexed channels, means for combining multiplexed data signals and signalling information, and demultiplexing means for selecting combined data signals and signalling information to be connected to each of said ports,

signalling input means connected to receive and temporarily store signalling information separated by said first stage,

signalling output means connected to receive and temporarily store signalling information to be combined by said first stage,

an input time switching stage means arranged to receive multiplexed data signals from said first stage, said input



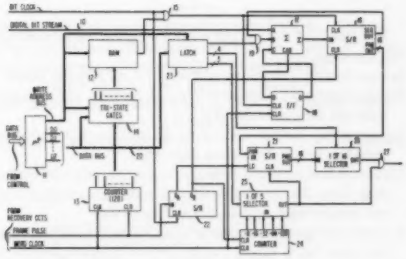
time switching stage means being arranged under the control of the central control unit to transmit signals from a particular input port in a corresponding particular time slot on a highway, and

an output time switching stage means for receiving signals from said input time switching stage means, said output time switching stage means being arranged to transmit data signals to said first stage for combination with signalling information and transmission to appropriate ports via said demultiplexing means.

4,430,734
DEMULTIPLEXER CIRCUIT

William M. Hubbard, Colts Neck, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 14, 1981, Ser. No. 330,462
Int. Cl.[3] H04J *3/16;* H04M *3/56*
U.S. Cl. 370—112 7 Claims



1. In a digital transmission system wherein digitally encoded voice signals are transmitted in time division multiplexed channels with plural channels being devoted to conference calls between three or more conferees, and data signals of multiple data rates are transmitted using other and different channels, demultiplexer apparatus for said digital transmission system being characterized by memory means (12) having a storage capacity at least equal to the number of time division multiplexed channels, means (11, 14) for storing in said memory means information as to the channel or channels to be demultiplexed out of the incoming transmitted signal, counter means (13) operating in synchronism with the incoming transmitted signal and serving to access the memory means to provide output signals indicative of the channel or channels carrying

information for the subscriber station, means (15, CLK of 16) using said output signals to read the digital signals intended for said station into a register means (16), and means (21, 24–27) for reading out the digital signals stored in said register means at a steady rate, said data signals being similarly read out at different but steady rates irrespective of the number of data bits and position of the same in a given channel.

4,430,735

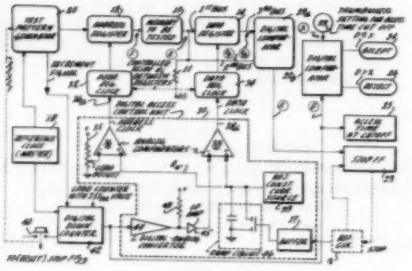
APPARATUS AND TECHNIQUE FOR TESTING IC MEMORIES

Robert D. Catiller, Garden Grove, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed May 26, 1981, Ser. No. 267,048

Int. Cl.³ G01R 31/28

U.S. Cl. 371—25 10 Claims



9. A method for testing semi-conductor memories comprising the steps of:

(a) generating a memory address into an address latch;

(b) clocking said address-latch address into said memory at a selected time-moment T_a;

(c) accessing output data from an addressed location in said memory into a data latch register;

(d) simultaneously and directly conveying said accessed output data from the same addressed location to a digital comparator means via a data clock at a time T_a;

(e) comparing at a subsequent time T_d the equality of data from said data latch register with data conveyed directly to said comparator means, said comparisons occurring by a test at each nanosecond test period starting from N nanoseconds and decremented down to 1 nanosecond;

(f) stopping the test when non-equality is detected;

(g) determining the nanosecond value of the test period which existed at the moment of detection of non-equality of compared data;

(h) wherein time T_a represents the start of a single time-test period when said address latch releases an address to said semiconductor memory whereby data accessed from said address is conveyed to said comparator means and also to said data latch register, and wherein time T_d represents the subsequent time that data is released from said data latch register for comparison with data directly conveyed to said comparator means.

4,430,736

CIRCUIT FOR CORRECTING DISTORTIONS IN A PCM TRANSMISSION DEVICE

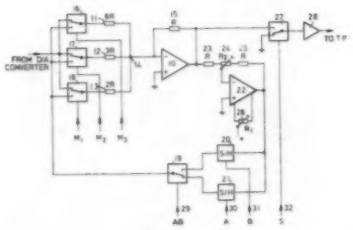
Werner Scholz, Gehrden, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs-GmbH, Frankfurt, Fed. Rep. of Germany

Filed Jul. 23, 1981, Ser. No. 286,167

Claims priority, application Fed. Rep. of Germany, Jul. 24, 1980, 3028066

Int. Cl.³ G06F 15/353

U.S. Cl. 371—31 25 Claims



1. In a circuit arrangement having an input for receiving a succession of sample values supplied thereto in a PCM transmission system, for correcting falsified sample values, the improvement comprising:

correction control means connected for detecting each falsified sample value and determining if the number, N, of falsified sample values received between successive unfalsified sample values exceeds a given plurality, n, of successive falsified sample values; and

interpolation means having a signal output and connected to said correction control means and operatively connected to said circuit arrangement input for deriving, and supplying to said signal output, a corrected value in place of each falsified sample value, said interpolation means being controlled by said correction control means for replacing, at said signal output, each of the first N-n falsified sample values of a succession of falsified sample values by the last occurring unfalsified sample value, constituting the corrected value, and for deriving, and applying to said signal output, a corrected value for each of the last n falsified values by effecting a weighted combination of the sample value appearing at said signal output and preceding the respective falsified value in time and the next unfalsified sample value in order to perform an at least approximately linear interpolation between the sample values which are thus combined.

4,430,737

EXCLUSIVE OR CIRCUIT AND PARITY CHECKING CIRCUIT INCORPORATING THE SAME

Herve Beranger, Fontainebleau, and Armand Brunin, LeMee, both of France, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 26, 1982, Ser. No. 342,875

Claims priority, application European Pat. Off., Jun. 25, 1981, 81430020

Int. Cl.³ G06F 11/10; H03K 19/21

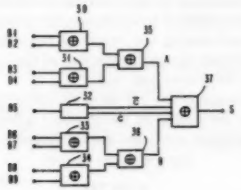
U.S. Cl. 371—49 28 Claims

1. An Exclusive OR circuit comprising two input terminals (1 and 2) to which binary signals A and B are applied and an output terminal (3) at which the result of the function A⊕B is generated, characterized in that it includes:

a generator (4) providing a reference voltage as its output,

a first circuit having two input terminals which are the input terminals of the Exclusive OR circuit and an output terminal (C1) at which the result of the function AB is generated, including first and second diode (D1, D2) each of

which has one of its terminals connected to one of the input terminals, and first and second transistors (T1, T2) having their emitters connected to the output of the reference voltage generator and their collectors connected to the output (C1) of said first circuit, each of the bases being connected to the other terminal of each diode, respectively;



a second circuit (T4, T5) provided with two inputs connected to the input terminals (1 and 2) of the Exclusive OR circuit, and an output (C2) at which the result of the logic function AB is generated,

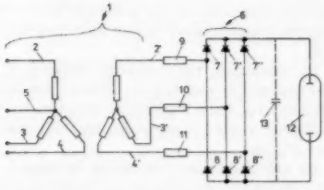
a NOR output circuit (T3, T6) having two inputs connected to the outputs of the first and second circuits and an output constituting the output terminal (3) of the Exclusive OR circuit.

4,430,738

ARRANGEMENT FOR THE CURRENT LIMITATION DURING THE CURRENT SUPPLY OF ELECTRICALLY EXCITED GAS LASERS

Werner Reif, Klosterneuburg, and Dieter Schuöcker, Vienna, both of Austria, assignors to Voest-Alpine Aktiengesellschaft, Linz, Austria

Filed Aug. 5, 1981, Ser. No. 290,303
Claims priority, application Austria, Aug. 14, 1980, 4166/80
Int. Cl.³ H01S *3/00*
U.S. Cl. 372—38 **4 Claims**



1. An arrangement for limiting the supply of an electric current to an electrically excited gas laser, comprising

a rotary current transformer connected to receive power from an A.C. power supply and having a primary side and a secondary side, both said primary and secondary sides including phase conductors,

inductances connected in each of said phase conductors of said transformer secondary side to limit the current provided at said transformer secondary side, and

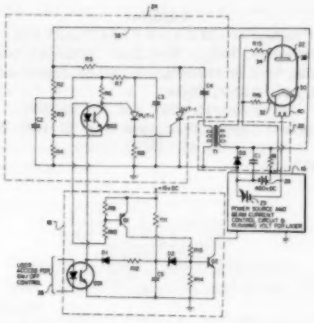
a current bridge rectifier connected to said inductances for producing at its output a substantially smooth D.C. output for said laser.

4,430,739

LASER SYSTEM WITH STANDBY MODE

William H. McMahan, 1467 Penrose Dr., Salt Lake City, Utah 84103

Filed Sep. 21, 1981, Ser. No. 304,232
Int. Cl.³ H01S *3/00*
U.S. Cl. 372—38 **15 Claims**



1. A laser system comprising:

a laser tube having an anode and a cathode, said laser tube comprising means requiring application of a high voltage to initiate production of a laser beam in the tube;

a power source connected to said laser tube, said source comprising means for providing both a high startup voltage and a continuous current for running said laser tube; and

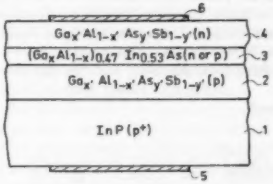
electronic circuit means for placing the laser of said system in a standby mode such that said laser beam is extinguished but the laser cathode continues to remain energized by said power source, said electronic circuit means comprising means for storing sufficient electrical energy while said beam is extinguished that production of the laser beam can be substantially instantaneously re-initiated by releasing the stored electrical energy to said laser tube.

4,430,740

LONG-WAVELENGTH SEMICONDUCTOR LASER

Trong L. Nuyen, and Baudouin de Cremoux, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Dec. 2, 1981, Ser. No. 326,555
Claims priority, application France, Dec. 5, 1980, 80 25911
Int. Cl.³ H01S *3/19*
U.S. Cl. 372—45 **4 Claims**



1. In a semiconductor laser of the type comprises a monocrystalline substrate of InP of a predetermined conductivity type, and at least the following epitaxial layers: a first confinement layer of the same conductivity type of the substrate, an active layer and a second confinement layer of opposite conductivity type, the confinement layers being constituted by materials having an energy gap of greater width than that of the material constituting the active layer, the improvement

wherein the material constituting said active layer is an alloy which corresponds to the formula:

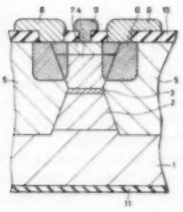
$$(Ga_xAl_{1-x})_{0.47}In_{0.53}As$$

with: $0<x<0.27$ and wherein the confinement layers are made of an alloy corresponding to the formula $Al_{0.47}In_{0.53}As$.

4,430,741
SEMICONDUCTOR LASER DEVICE

Tadashi Fukuzawa, Tokyo; Michiharu Nakamura, and Susumu Takahashi, both of Hinodemachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 15, 1981, Ser. No. 225,399
Claims priority, application Japan, Jan. 23, 1980, 55-5755
Int. Cl.³ H01S 3/19
U.S. Cl. 372—46 **5 Claims**

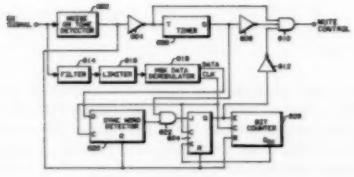


1. A semiconductor laser device comprising:
a semiconductor assembly for effecting laser oscillation in which at least first, second and third semiconductor layers are successively stacked on a predetermined semiconductor body, said first and third semiconductor layers being small in a refractive index and great in a forbidden band gap relative to said second semiconductor layer and having conductivity types opposite to each other,
current injection means for the laser oscillation and including a first electrode disposed on a crystal surface of said semiconductor assembly remote from said semiconductor body, and a second electrode disposed on a surface of said semiconductor body,
means including spaced impurity regions and electrodes connected thereto for controlling depletion regions within a path of current of said current injection means in a manner such as to intersect with the current path, and
an optical resonator for the laser oscillation.

4,430,742
DATA MUTING METHOD AND APPARATUS FOR RADIO COMMUNICATIONS SYSTEMS

William W. Milleker, Chicago; Thomas A. Freeburg, Arlington Heights, and Michael A. Stepien, Hoffman Estates, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 20, 1981, Ser. No. 323,644
Int. Cl.³ H04Q 7/00
U.S. Cl. 375—5 **23 Claims**

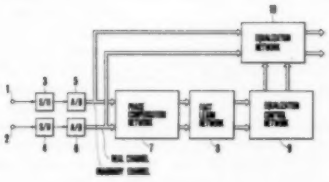


1. Apparatus for muting the output of a receiver that receives a carrier signal modulated with a variable length data signal, the data signal including a synchronization word having a predetermined binary bit pattern followed by an information word having a variable number of binary bits, said muting apparatus comprising:
means for detecting the presence of the carrier signal;
means for muting the output of the receiver for a predetermined time interval when the carrier signal has been detected;
means for detecting the predetermined binary bit pattern of the synchronization word during the predetermined time interval and muting the output of the receiver when the predetermined binary bit pattern of the synchronization word has been detected; and
means for detecting the last bit of the information word and unmuting the output of the receiver when the last bit of the information word has been detected.

4,430,743
FAST START-UP SYSTEM FOR TRANSVERSAL EQUALIZERS

Kojiro Watanabe, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Nov. 13, 1981, Ser. No. 321,101
Claims priority, application Japan, Nov. 17, 1980, 55-161534; Dec. 10, 1980, 55-174198
Int. Cl.³ H04B 3/18
U.S. Cl. 375—13 **2 Claims**



1. A fast start-up system for a transversal equalizer comprising:
means provided in a transmitter for generating a periodic symbol sequence with a period L, the auto correlation function of said sequence being completely O except for its center;
means for generating and transmitting a test signal based upon said generated symbol sequence;
means provided in a receiver for generating the same periodic symbol sequence as that generated in the transmitter in a proper phase relation thereto according to a received signal;
means for calculating the correlation between L sampled values obtained by sampling the received test signal at the symbol interval and a sequence obtained by recirculating said periodic symbol sequence for each of consecutive M shifted phases;
means for calculating the correlation between L sampled values obtained by sampling the received test signal at the symbol inerval with a phase diferring from the phase of said first-mentioned sampled values by an amount corresponding to one half of the symbol interval and a sequence obtained by recirculating said periodic symbol sequence for each of M′ consecutive shifted phases;
means for multiplying said calculated M+M′ correlation values by a constant;
means for obtaining discrete Fourier transform of the M+M′ multiplied correlation values at N points equal to or greater than M+M′ in number;
means for storing values of a predetermined frequency characteristic for frequency points obtained as the discrete Fourier transform;

means for dividing the stored values by said respective values obtained by the discrete Fourier transform;

means for obtaining inverse discrete Fourier transform of the N divided values; and

means for initializing, with the numerical values obtained as the inverse discrete Fourier transform, the tap gain of a transversal automatic equalizer with the basic delay interval equal to one half the symbol interval;

thereby permitting a sufficiently equalized state to be realized fast with a short test sequence.

4,430,744

ADAPTIVE IF EQUALIZER FOR DIGITAL TRANSMISSION

Edward R. Johnson, Sunnyvale, Calif., assignor to GTE Automatic Electric Incorporated, Northlake, Ill.

Filed Dec. 18, 1981, Ser. No. 331,957

Int. Cl.³ H04B *3/04*

U.S. Cl. 375—14 **8 Claims**

1. In a receiving terminal of a radio system, an adaptive equalizer serially connected between the If output of the radio receiver section and the IF base band converter for correcting amplitude and delay distortion introduced into the radio signal during propagation, comprising:

a plurality of band-pass filters having center frequencies spaced at equal intervals across the passband of the IF band of the radio receiver, each filter having equal passbands that are adjacent but not overlapping, the band-pass filter inputs being connected together for receiving a corrected signal at the output of the adaptive equalizer; each band-pass filter providing that portion of the radio signal selected by the passband of the filter at a separate output port;

a plurality of detectors, one for each of the plurality of band-pass filters, each detector having an input terminal adapted to receive the selected signal from the output port of an associated band-pass filter and each detector providing at an output port a detected or direct current voltage, the amplitude of which varies in accordance with the amplitude of the associated selected signal and which is proportional thereto;

a control circuit means having a plurality of input ports each accepting the direct current voltage from an associated detector, and providing at an output a first control voltage having an amplitude that is proportional to the difference in amplitude of the detected voltages of the detectors associated with the end point band-pass filters which have passbands nearest the lower and upper frequency ends of the IF band, and providing separate control voltages at associated outputs, one for each detected voltage from each detector that is associated with the intermediate band-pass filters, the amplitude of each of said separate control voltages being derived from the difference between the detected output voltage of an associated detector and an average of the detected output voltages of the adjacent detectors;

bump equalizer means having a number of tandem sections equal to the number of intermediate band-pass filters, each of said sections being responsive to an associated separate control voltage; each of said bump equalizer sections either attenuating or enhancing the IF frequencies which appear in the passband of an associated band-pass filter, the amount of attenuation or enhancement being proportional to the amplitude difference and sign between the associated separate control voltage and a reference voltage, whereby a dip or bump occurs at the selected bassband frequencies; said bump equalizer means having an input port for accepting the IF frequencies from the radio frequency section, having a plurality of inputs, one for each separate control voltage, and having an output port;

slope equalizer means having an input port adapted for connection to the output port of said bump equalizer means, having an input adapted to accept said first control voltage, said slope equalizer means being responsive to said first control voltage to correct for the slope introduced across the IF band and to insert group delay correction, which is proportional to the amplitude of the slope correction, and having an output port; and

means responsive to the output port signal of said slope equalizer means for maintaining a prescribed signal level at the output port thereof which is the output of the adaptive equalizer.

4,430,745

DIGITAL DATA TRANSMISSION

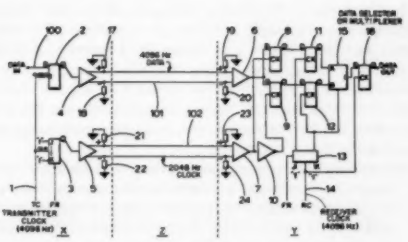
Colin R. Betts, Ipswich, England, assignor to Post Office, London, England

Continuation of Ser. No. 42,224, May 24, 1979, abandoned. This application Feb. 8, 1982, Ser. No. 347,057

Claims priority, application United Kingdom, May 30, 1978, 24413/78

Int. Cl.³ H04L *25/02*

U.S. Cl. 375—25 **12 Claims**



1. A data transmission system for transmitting digital data at a first predetermined rate along a transmission path with at least one data channel and at least one separate clock signal channel from a first location to a second location, said first rate being a rate greater than the maximum rate at which clock pulses may be transmitted along said data channel without significant timing error, said system comprising:

a first clock signal generator and transmitter means at said first location for generating and transmitting on said clock signal channel clock signals have a second rate at which said clock signals may be transmitted along said clock channel without significant timing error,

a data transmitter at said first location arranged to transmit said digital data on said data channel at said first rate,

a plurality of data stores at said second location,

switching means at said second location arranged to distribute the data received from said data channel of said second location into said data stores under control of said first clock signal received from said clock channel,

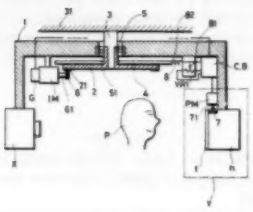
means at said second location for recombining the data from said stores into a serial data stream under control of a second clock signal including a second clock signal generator at said second location for providing said second clock signal, the frequency of said second clock being a multiple of the frequency of said first clock signal and at substantially said first predetermined rate.

4,430,746

TOMOGRAPH FOR PHOTOGRAPHING ENTIRE JAWS

Masakazu Suzuki, Shin Nakamachi; Toshiaki Ikeda, Yahata, and Shuhei Furuichi, Shiga, all of Japan, assignors to Kabushiki Kaisha Morita Seisakusho, Kyoto, Japan

Filed Jun. 23, 1981, Ser. No. 276,695
Claims priority, application Japan, Jun. 27, 1980, 55-88060
Int. Cl.³ G03B 41/16
U.S. Cl. 378—40 1 Claim



1. A tomograph for photographing the entire jaws which is designed to photograph a curved plane section of an object which includes a rotary arm rotated by a rotary arm driving motor, said rotary arm having provided thereon an X-ray generator and an X-ray film feed means in an opposed relation with each other with the object positioned between the X-ray generator and the film feed means, said tomograph being characterized in that it comprises:

an eccentric cam means predetermined in its configuration in accordance with said object to be photographed, said cam means being mounted at a suitable place of said rotary arm and adapted to be rotated in accordance with the rotation of said arm;

a potentiometer cooperating with said eccentric cam, said potentiometer changing resistance in response to the rotation of said rotating arm;

a tachogenerator directly connected to said rotary arm driving motor for generating an electromotive force;

a voltage shunting means for dividing said electromotive force outputted from said tachogenerator into three paths and for deriving a reference point input voltage from a first path of said paths, for deriving a signal input voltage by applying a second path of said paths to the potentiometer and for deriving a presettable reference point correction voltage from a third path of said paths;

a reference point correction circuit for subtracting said signal input voltage and reference point corection voltage;

a V/F converter circuit receiving an additional output obtained by adding an output of said reference point correction circuit to said reference point input voltage and for generating a voltage pulse proportional to said additional output;

a changeover resistance means for selectively changing said output of said reference correction circuit supplied to said V/F converter circuit;

a pulse motor for driving said film feed means; and

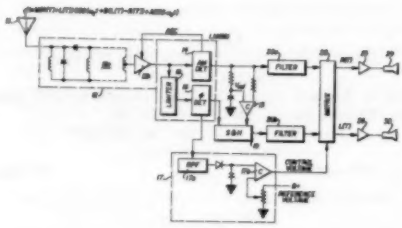
a pulse motor driving circuit receiving said voltage pulse outputted from said V/F converter circuit thereinto to thereby drive the film feed pulse motor for said film feed means.

4,430,747

RECEIVING APPARATUS FOR STEREOPHONIC BROADCAST HAVING AMPLITUDE AND ANGLE MODULATED SIGNAL COMPONENTS

Robert D. Streeter, Fort Wayne, Ind., assignor to Magnavox Consumer Electronics Company, New York, N.Y.

Filed Jul. 27, 1981, Ser. No. 287,037
Int. Cl.³ H04H 5/00
U.S. Cl. 381—15 9 Claims



1. A receiver for demodulating a radio frequency signal which is simultaneously modulated in amplitude by the summation of stereophonic related signals (R(t) and (L(t) and linearly modulated in phase by the difference of said related signals L(t)−R(t), comprising:

a tunable radio frequency filter for selectively tuning said radio frequency signal;

an envelope detector connected to said filter for providing a signal proportional to said summation of stereophonically related signals;

a phase detector for receiving said radio frequency signal from said tunable radio frequency filter, and providing an output signal which is linearly proportional to a phase change in said radio frequency signal, said radio frequency signal providing increased sampling of said linear phase modulation at said radio frequency rate and a reduction in distortion products;

and

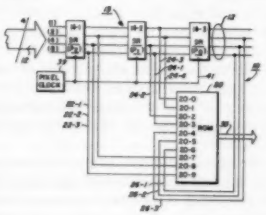
matrix means for combining said phase detector output signal with said envelope detector signal whereby stereophonic related signals R(t), L(t) are produced by combining a linearly phase detected signal with an amplitude detected signal.

4,430,748

IMAGE THRESHOLDING SYSTEM

Richard H. Tuhro, Webster, and Douglas G. Wiggins, Penfield, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Sep. 21, 1981, Ser. No. 304,429
Int. Cl.³ G09G 1/00
U.S. Cl. 382—50 1 Claim



1. In an image processing system for thresholding a stream of image pixels to provide refined image values, the combination of:

a first memory for storing a plurality of thresholded pixel image values at discrete memory locations, said first memory including plural input terminals through which said first memory locations are addressed;

a plurality of shift register stages in series with said image pixel stream, said image pixels passing through said shift register stages in succession;

plural address lines coupled to said first memory input terminals for addressing said first memory locations, said address lines being coupled to the outputs of said shift register stages in predetermined order whereby pixels in said pixel stream provide an address for addressing said first memory locations so that said first memory provides pixel image values corresponding thereto;

a second memory for storing a second plurality of thresholded pixel image values at discrete memory locations, said second memory including plural input terminals through which said second memory locations are addressed; and

plural address lines coupled to said second memory input terminals for addressing said second memory locations, at least one of said second memory address lines being coupled to the output of said first memory whereby the pixel image values output by said first memory address said second memory so that said image pixel values from said first memory are further processed by said second memory.

4,430,749

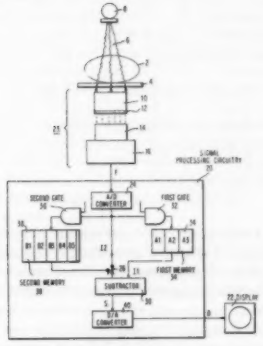
MEDICAL IMAGING APPARATUS AND METHOD FOR FURNISHING DIFFERENCE IMAGES

Mark A. Schardt, Schaumburg, Ill., assignor to Siemens Gammasonics, Inc., Des Plaines, Ill.

Filed Jun. 30, 1981, Ser. No. 280,055

Int. Cl.³ H04N *5/32*; G06F *15/42*

U.S. Cl. 382—54 **11 Claims**



1. A method for furnishing difference images from a video signal containing a sequence of images obtained from a patient under examination, comprising the steps of

(a) recording a first of said images contained in said video signal in a first image storage means, thereby forming a primary mask;

(b) recording a subsequent second of said images contained in said video signal in a second image storage means;

(c) recording a subsequent third of said images contained in said video signal in a third image storage means;

(d) recording the images contained in said video signal following said third image, alternatingly in said second and said third image storage means;

(e) subtracting said primary mask from each of said second, third and further subsequent images contained in said video signal until provision of a signal for starting data acquisition;

(f) providing a signal for starting data acquisition;

(g) selecting from the second and third image storage means that stored image which has been most recently completed at the time of providing the data acquisition signal, as a secondary mask; and

(h) subtracting said secondary mask from images contained in said video signal which appear after said data acquisition signal has been provided, thereby forming said difference images.

4,430,750

METHOD AND APPARATUS FOR AUTOMATIC RECOGNITION OF AN IMAGE PATTERN, PARTICULARLY OF A LINE PATTERN

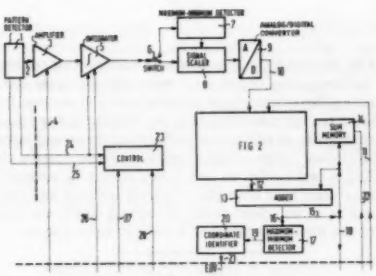
Paul Koellensperger, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Apr. 23, 1981, Ser. No. 256,792

Claims priority, application Fed. Rep. of Germany, May 12, 1980, 3018170

Int. Cl.³ G06K *9/32*

U.S. Cl. 382—8 **9 Claims**



1. In a method of recognizing image patterns, particularly line patterns, in which a scanning device scans, in columns, an image field carrying an image pattern, a discovered object image with a sought image pattern is executed by converting image points into electrical signal sequences which are compared with signals of a stored pattern, the improvement comprising the steps of:

storing feature addresses including respective positive and negative operational signs;

repeatedly spatially shifting, with respect to the feature addresses, actual values obtained from scanning to determine line pattern properties and position in the image field and the degree of similarity to a sought pattern in real time;

weighting the column signal; and

selecting a positive or negative sum of the numerical values corresponding to the weighted column signals.

4,430,751

SELF-SEALING VALVED BAG

Norman K. Miller, Concordville, Pa. 19331

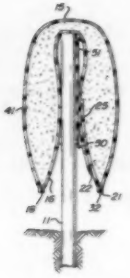
Continuation-in-part of Ser. No. 322,536, Nov. 18, 1981. This application Oct. 7, 1982, Ser. No. 433,246

Int. Cl.³ F42B *3/00*; B65D *30/24, 33/14*

U.S. Cl. 383—6 **7 Claims**

1. A self-sealing valved bag for fluid contents comprising a pair of elongate flexible sheet outer walls in facing relation with each other, outer walls securing means securing together said outer walls about a line configuration closed except for an unsecured region at one end of said outer walls, a flexible sheet inner wall interposed between and in facing relation with said outer walls extending generally across said unsecured region, inner wall securing means securing together said inner wall

and one of said outer walls for location of said inner wall in face to face sealing engagement with said one outer wall, said inner wall securing means extending less than entirely across said unsecured region to define an access passageway communicating between the interior of said outer walls and the exterior thereof when said inner and one outer walls are displaced away from each other, additional securing means securing together said inner wall and the other of said outer walls entirely across said unsecured region, said passageway being



closed by the pressure of contents in said interior urging said inner wall in sealing engagement with said one outer wall, and a mounting flap exteriorly of an outer wall and secured thereto to define a pocket extending from an opening facing longitudinally outwardly of said outer walls inwardly to and terminating in a closure longitudinally medially of said outer walls for receiving in said pocket an upstanding mounting member with said outer walls bent over the mounting member and opposite end regions of the outer walls depending stably on opposite sides of the mounting member in an operative position.

4,430,752

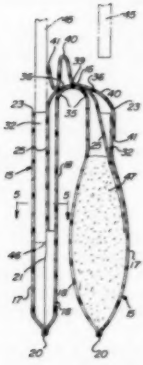
VALVED BAG WITH SEALING FLAP

Norman K. Miller, Concord Industrial Park, Concordville, Pa. 19331

Continuation-in-part of Ser. No. 322,536, Nov. 18, 1981, and Ser. No. 433,246, Oct. 7, 1982. This application Feb. 28, 1983, Ser. No. 470,520

Int. Cl.³ F42B *03/00*; **B65D** *30/22, 30/24, 33/14*

U.S. Cl. 383—6 **7 Claims**



1. A valved bag for fluid contents comprising a pair of flexible sheet outer walls in facing relation with each other, outer wall securing means securing together said outer walls about a line configuration closed except for an unsecured region, a flexible sheet inner wall interposed between and in facing relation with said outer walls extending generally across said unsecured region, inner wall securing means securing together said inner wall and one of said outer walls for location of said inner wall in face to face sealing engagement with said one outer wall, said inner wall securing means extending less than entirely across said unsecured region to define an access passageway communicating between the interior of said outer walls and the exterior thereof when said inner and one outer walls are displaced away from each other, extensions on said inner and other outer walls extending beyond said one outer wall at said unsecured region, additional securing means securing together said inner and other outer wall extensions entirely across said unsecured region, said passageway being closed by pressure in said interior urging said inner wall in sealing engagement with said one outer wall, and a sealing flap exteriorly of said inner wall extension and the adjacent region of said one outer wall and secured by said additional and outer wall securing means, said flap being in sealing engagement with said one outer wall by the internal pressure of said bag.

4,430,753

RADIO RECEIVER

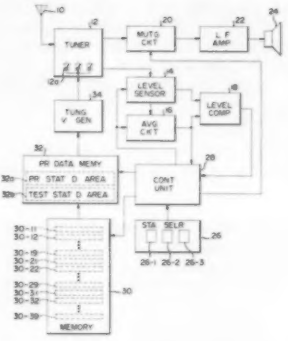
Yuji Shiratani, Otsu, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 21, 1981, Ser. No. 285,440

Claims priority, application Japan, Jul. 24, 1980, 55-102005; Aug. 4, 1980, 55-108567; Oct. 20, 1980, 55-147167

Int. Cl.³ H04B *1/16, 17/00, 3/60*

U.S. Cl. 455—52 **14 Claims**



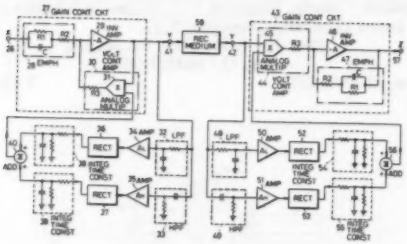
1. A radio receiver arranged during the physical movement thereof to selectively receive a common broadcasting program from a plurality of scattered broadcast stations which are respectively broadcasting said common broadcasting program at different frequencies, said receiver comprising a means for temporarily exchanging a tuning of said receiver from a first one of said broadcast stations having said common broadcasting program and presently being received by said receiver to a second one of said broadcast stations having said common broadcasting program and not now presently being received by said receiver during the reception of said program from said first broadcast station, a means for comparing a reception level of said common broadcasting program of said first broadcast station with that of said second broadcast station, and a means for controlling said tuning of said receiver for receiving said common broadcasting program from the one of said first and second broadcast stations having a higher reception level;

wherein said means for exchanging said tuning of said receiver from said first broadcast station to said second broadcast station temporarily exchanges said tuning either for long time periods when said reception level for said first broadcast station is high or for short time periods when said reception level for said first broadcast station is low.

4,430,754
NOISE REDUCING APPARATUS

Yukinobu Ishigaki, Machida, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Aug. 28, 1981, Ser. No. 297,106
Claims priority, application Japan, Aug. 29, 1980, 55-119078
Int. Cl.³ H04B 1/64
U.S. Cl. 455—72 7 Claims



1. A noise reducing apparatus comprising:

a single first variable gain control circuit means for giving a level compression characteristic to an input signal in response to a single first composite control voltage, to produce an output signal to a transmission path;

first control voltage producing circuit means for dividing an output signal of said first variable gain control circuit means into a plurality of frequency bands, and for producing a plurality of control voltages respectively given with mutually different integration time constants for each of the divided frequency bands;

first adding circuit means for respectively additively composing said plurality of control voltages obtained from said first control voltage producing circuit means, to obtain said single first composite control voltage;

single second variable gain control circuit means responsive to a single second composite control voltage for giving a level expansion characteristic complementary to said level compression characteristic to a level compressed signal received through said transmission path to produce an output signal;

second control voltage producing circuit means for dividing an input signal of said second variable gain control circuit into a plurality of frequency bands, and for producing a plurality of control voltages respectively given with mutually different integration time constants for each of the divided frequency bands; and

second adding circuit means for respectively additively composing said plurality of control voltages obtained from said second control voltage producing circuit, to obtain said single second composite control voltage.

4,430,755
PORTABLE RADIO TELEPHONE

Mark Nadir, Fort Lauderdale; Gordon W. James, Plantation; William J. Kuznicki, Coral Springs, and Jerome A. Nieds, Margate, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed May 14, 1981, Ser. No. 263,797
Int. Cl.³ H03J 7/18
U.S. Cl. 455—77 3 Claims

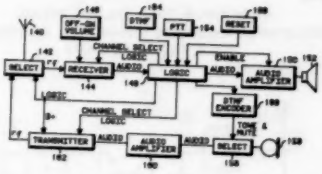
1. In a simplex portable transceiver tuned to a first channel of a plurality of channels that may contain a channel acquisition tone that is converted to an electrical signal with audio variations and applied to a limiter to produce limited audio, an automatic scanner controlling a change to a second of the plurality of channels, the scanner comprising:

an active filter (272) connected to the limiter, the filter (272) passing a narrow band of frequencies including the frequency of the channel acquisition tone; a peak detector (274) connected to the active filter (272) and responsive to the limited filtered channel acquisition tone to produce negative-going pulses;

a NOR gate (276) connected to the peak detector (274) to produce an output;

a J-K flip-flop (278) connected to NOR gate (276) and set by the output from NOR gate (276) to produce an output in the absence of channel acquisition tone;

a programmable counter (282) set to the output of J-K flip-flop (278) to produce a system clock signal on a line (284) and an output square wave having a period of a shorter time when channel acquisition tone is received and a longer time when channel acquisition tone is not received;



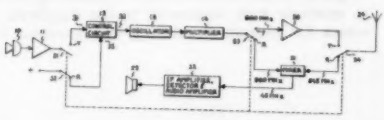
a four-bit counter (280) connected to J-K flip-flop (278), programmable counter 282 and NOR gate (276), counter (280) being clocked by the output square wave of programmable counter (282) and reset continually by the output from NOR gate (276) that indicates that channel acquisition tone is present; and

a NOR gate (286) connected to programmable counter (282) to produce an output that prevents scan when the receiver is receiving channel acquisition tone or during a scan delay or use of the transceiver.

4,430,756
OSCILLATOR CONTROL CIRCUIT

Rodney A. Dolman, Lynchburg, and Gregory N. Mears, Forest, both of Va., assignors to General Electric Company, Lynchburg, Va.

Filed Feb. 22, 1982, Ser. No. 350,981
Int. Cl.³ H04B 1/44, 1/50
U.S. Cl. 455—78 2 Claims



1. An improved radio transceiver comprising:

a. a radio transmitter for transmitting on a frequency F1 to a remote station;

b. a radio receiver for receiving on a frequency F2 from said remote station, said radio receiver having a mixer circuit for producing an intermediate frequency substantially equal to the difference between said frequency F1 and said frequency F2;

an oscillator having a control input and an output for producing said frequency F1 in response to a transmitting control signal applied to said control input, and for producing a mixer frequency that differs from said frequency F2 by an amount substantially equal to said intermediate frequency but that differs from said frequency F1 by an amount sufficient to avoid capture of said remote station by radiation from said radio receiver in response to a receiving control signal applied to said control input;

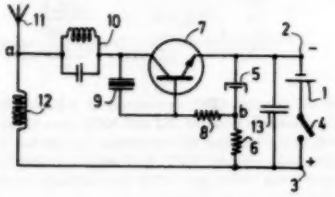
d. means for selectively coupling said oscillator output to said radio transmitter or to said mixer circuit of said radio receiver;

e. control means having a control input and an output;
f. and means coupling said control means output to said oscillator control input for selectively applying either said transmitting control signal or said receiving control signal to said oscillator control input in response to transmit or receive command signals applied to said control input of said control means.

4,430,757
RADIOELECTRIC SIGNAL TRAINS GENERATOR AND PORTABLE TRANSMITTER COMPRISING SUCH A GENERATOR

Laszlo Szakvary, Paris, France, assignor to Elphora, Paris, France

Filed Feb. 3, 1982, Ser. No. 345,466
Claims priority, application France, Nov. 19, 1981, 81 21689
Int. Cl.³ H04B *1/034*
U.S. Cl. 455—100 **8 Claims**

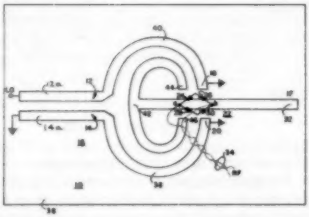


1. An electrical pulse train generator comprising:
supply means for providing direct-current electrical power;
a condensor and first resistance serially connected together at a first point and connected across said supply means;
a transistor having a base, emitter and collector;
a second resistance connecting the base of said transistor to said first point;
said emitter of said transistor being connected to said supply means;
a quartz crystal connected between said collector and base of said transistor, said crystal oscillating at a third harmonic frequency;
said generator including means turned to the third harmonic frequency of said quartz crystal for producing oscillations at relatively high frequencies in the megahertz range; means for periodically driving said transistor from a blocking state into saturation by charging and discharging said condensor to periodically pass said oscillations; and antenna means for emitting said oscillations.

4,430,758
SUSPENDED-SUBSTRATE CO-PLANAR STRIPLINE MIXER

Richard V. Snyder, Ringwood, N.J., assignor to Scientific Component Corporation, Brooklyn, N.Y.

Filed Jun. 3, 1982, Ser. No. 384,556
Int. Cl.³ H04B *1/26*
U.S. Cl. 455—227 **8 Claims**

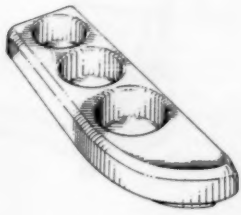


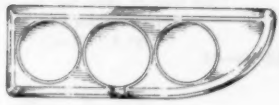
1. A suspended-substrate coplanar mixer comprising:
a strip line compensated balun including a first strip line section having (1) a straight portion and (2) a curved portion forming an inner strip line segment and a second strip line section having (1) a straight portion equidistantly spaced apart from said straight portion of said first strip line section and (2) a curved portion forming an outer strip line segment, the curved portions oppositely curved facing away from each other and each having substantially the same radius of curvature, and
a strip line mixer including an integrated diode quad having input means, a strip line output terminal directly coupled to said diode quad, a curved interior strip line segment disposed within, equidistantly spaced from and having a smaller radius of curvature than both of said outer and said inner strip line segments for providing electrical isolation between said balun and said output terminal and capacitively coupling energy between equidistantly spaced strip lines.

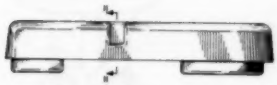
272,484
SKI BOOT
Mariano Sartor, Montebelluna, Italy, assignor to Nordica S.p.A., Montebelluna, Italy
Filed Sep. 14, 1981, Ser. No. 301,682
Claims priority, application Italy, Mar. 19, 1981, 21157/81[U]
Term of patent 14 years
Int. Cl. D2—*04*
U.S. Cl. D2—276

272,485
SPOOL
Michael R. Philips, Pomona, N.Y., assignor to Jonathan Temple & Co., Inc., Hackensack, N.J.
Filed Aug. 27, 1981, Ser. No. 297,025
Term of patent 14 years
Int. Cl. D02—*99;* D15—*06*
U.S. Cl. D3—24

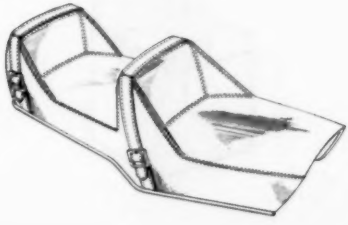
272,486
DRINK CUP HOLDER FOR VEHICLES
Andrew J. Benedetti, 111 'F' St. S.W., Auburn, Wash. 98002
Filed Jan. 9, 1981, Ser. No. 223,585
Term of patent 14 years
Int. Cl. D03—*99;* D07—*99*
U.S. Cl. D3—40



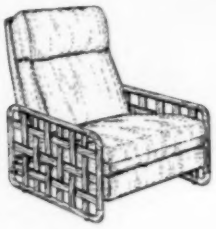




272,487
MOTORCYCLE SEAT
Ronald H. Powers, 840 Production Pl., Newport Beach, Calif. 92664
Filed Jun. 26, 1981, Ser. No. 277,595
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D6—48.1



272,488
CHAIR
Stapleton Long, Morristown, Tenn., assignor to The Berkline Corporation, Morristown, Tenn.
Filed Jan. 7, 1982, Ser. No. 337,608
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—67



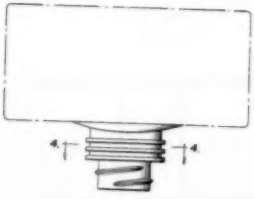
272,489
FOOTSTOOL
Roy E. Satterfield, 309 Oak Park Dr., Knoxville, Tenn. 37918
Filed Nov. 25, 1981, Ser. No. 324,799
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—74

272,490
CHAIR
Richard K. Ogg, c/o Keneco, R.R. 3, Box 34, Littlestown, Pa. 17340
Filed Jan. 22, 1982, Ser. No. 341,625
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—75

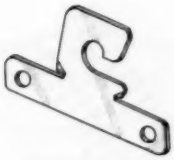
272,491
RAZOR DISPENSER
Claude Aracil, 2128 E. Baltimore St., Baltimore, Md. 21231
Filed Apr. 16, 1981, Ser. No. 254,907
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D6—88

272,492
SOAP DISH
Andre Bennato, Paris, France, assignor to Sanistyl Creations S.A.R.L., Nogent Sur Marne, France
Filed Sep. 25, 1980, Ser. No. 190,827
Claims priority, application France, Mar. 26, 1980, 800981
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D6—90

272,493
NECK AND FLANGE FOR SOAP CARTRIDGE
Robert L. Steiner, and Randel P. Smith, both of Chicago, Ill., assignors to Steiner Corporation, Salt Lake City, Utah
Filed Feb. 2, 1981, Ser. No. 230,818
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D6—95

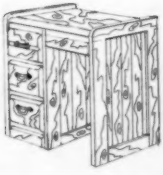


272,494
BOOK HANGER
John E. Mahowald, 1401 Klepper Ave., Kingsburg, Calif. 93631
Filed Oct. 29, 1981, Ser. No. 316,119
Term of patent 14 years
Int. Cl. D6—*08, 06*
U.S. Cl. D6—113



272,495
DOUBLE DRESSER
William P. Kemp, III, Goldsboro, and Clarence R. Duncan, Jr., Greensboro, both of N.C., assignors to Kemp Furniture Industries, Inc., Goldsboro, N.C.
Filed Jan. 14, 1983, Ser. No. 457,895
Term of patent 14 years
Int. Cl. D06—*04*
U.S. Cl. D6—160

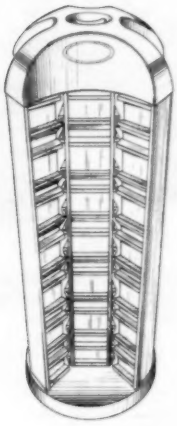
272,496
STUDENT DESK
William P. Kemp, III, Goldsboro, and Clarence R. Duncan, Jr., Greensboro, both of N.C., assignors to Kemp Furniture Industries, Inc., Goldsboro, N.C.
Filed Jan. 14, 1983, Ser. No. 457,893
Term of patent 14 years
Int. Cl. D06—*04*
U.S. Cl. D6—162



272,497
CHEST OF DRAWERS
William P. Kemp, III, Goldsboro, and Clarence R. Duncan, Jr., Greensboro, both of N.C., assignors to Kemp Furniture Industries, Inc., Goldsboro, N.C.
Filed Jan. 14, 1983, Ser. No. 457,892
Term of patent 14 years
Int. Cl. D06—*04*
U.S. Cl. D6—165

272,498
COMBINED NIGHT STAND AND HUTCH
William P. Kemp, III, Goldsboro, and Clarence R. Duncan, Jr., Greensboro, both of N.C., assignors to Kemp Furniture Industries, Inc., Goldsboro, N.C.
Filed Jan. 14, 1983, Ser. No. 457,894
Term of patent 14 years
Int. Cl. D06—*04*
U.S. Cl. D6—165

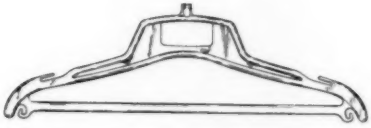
272,499
CARDED MERCHANDISE DISPLAY UNIT
Raymond J. Cuminale, New York, N.Y., assignor to Trifari, Krussman & Fishel, Inc., New York, N.Y.
Filed Jun. 8, 1981, Ser. No. 271,581
Term of patent 14 years
Int. Cl. D06—*04*
U.S. Cl. D6—188



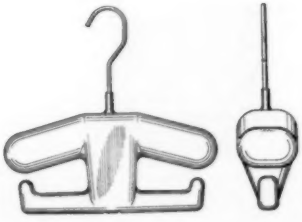
272,500
SHELVING SYSTEM FOR CANS OR THE LIKE
Leroy Ray, 5840 S. National, and Frank D. Dickey, 850 W. Highland, both of, Springfield, Mo. 65807
Filed Jun. 22, 1981, Ser. No. 275,842
Term of patent 14 years
Int. Cl. D06—*04*
U.S. Cl. D6—190

272,501
TIE RACK
Rudolf Rutishauser, 1588 S. 150 West, Orem, Utah 84057
Filed Mar. 2, 1982, Ser. No. 353,931
Term of patent 14 years
Int. Cl. D6—*08*
U.S. Cl. D6—251

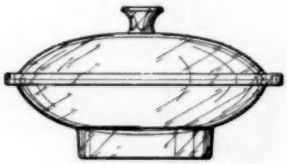
272,502
GARMENT HANGER BODY
John H. Batts, East Grand Rapids, and Everett L. Duester, Zeeland, both of Mich., assignors to John Thomas Batts, Inc., Zeeland, Mich.
Filed Jun. 5, 1981, Ser. No. 271,108
The portion of the term of this patent subsequent to Feb. 15, 1997, has been disclaimed.
Term of patent 14 years
Int. Cl. D6—*08*
U.S. Cl. D6—254

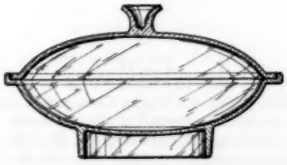


272,503
HANGER FOR A DIVER'S WET SUIT
Christopher J. Delucchi, Solana Beach, Calif., assignor to Alan K. Uke, San Diego, Calif.
Filed Aug. 17, 1981, Ser. No. 293,370
Term of patent 14 years
Int. Cl. D6—*08*
U.S. Cl. D6—255



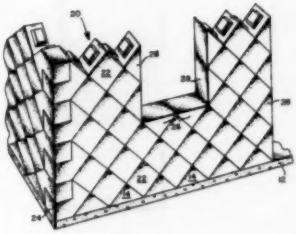
272,504
CASSEROLE
Nicholas P. Angelakos, Staten Island, N.Y., assignor to Lancaster Colony Corporation, New York, N.Y.
Filed Aug. 27, 1981, Ser. No. 296,681
Term of patent 14 years
Int. Cl. D07—*01*
U.S. Cl. D7—17





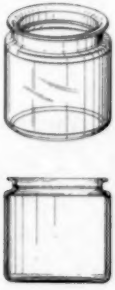
272,505
BREAD SERVING TRAY OR THE LIKE
Robert H. C. M. Daenen, Hekelgem, and Pieter K. J. De Coster, Aalst, both of Belgium, assignors to Dart Industries Inc., Northbrook, Ill.
Filed Sep. 18, 1980, Ser. No. 188,408
Term of patent 14 years
Int. Cl. D07—*99*
U.S. Cl. D7—37

272,506
FLOATING HOLDER FOR A TUMBLER OR THE LIKE
James H. Steiner, 2378 Woodland Ter., Fort Myers, Fla. 33907
Filed Oct. 23, 1981, Ser. No. 314,248
Term of patent 14 years
Int. Cl. D07—*01*
U.S. Cl. D7—70

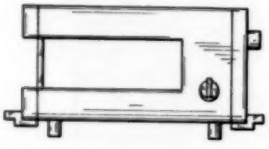


272,507
CANISTER JAR AND CLOSURE
Rino Conti, Stoughton, Mass., assignor to Dart Industries Inc., Northbrook, Ill.
Filed Aug. 7, 1980, Ser. No. 176,157
Term of patent 14 years
Int. Cl. D07—*01*
U.S. Cl. D7—79

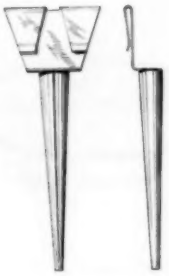
272,508
CANISTER JAR OR THE LIKE
Rino Conti, Stoughton, Mass., assignor to Dart Industries Inc., Northbrook, Ill.
Filed Aug. 7, 1980, Ser. No. 176,158
Term of patent 14 years
Int. Cl. D07—*07*
U.S. Cl. D7—79



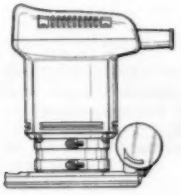
272,509
ELECTRONIC COOKING APPARATUS
Yoshitsugu Hirose, and Masakazu Sugiyama, both of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Feb. 5, 1981, Ser. No. 231,760
Claims priority, application Japan, Aug. 14, 1980, 55-33568
Term of patent 14 years
Int. Cl. D07—*02*
U.S. Cl. D7—365



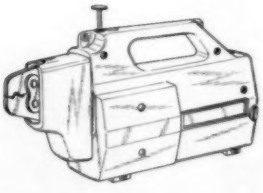
272,510
BENDER BOARD HOLDER OR SIMILAR ARTICLE
Elsie J. Drake, 6906 Eureka, Riverside, Calif. 92503
Filed Mar. 6, 1981, Ser. No. 241,422
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—1



272,511
ELECTRIC SANDER
Yoshiyuki Sato, Fuchu, and Yutaka Kanamaru, Kamakura, both of Japan, assignors to Ryobi Ltd., Fuchu, Japan
Filed Sep. 23, 1981, Ser. No. 304,768
Claims priority, application Japan, Mar. 26, 1981, 56-12731
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—62



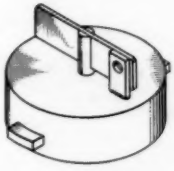
272,512
ELECTRIC PRESSURE CONNECTING MACHINE
Yasuharu Sakai, Kyoto, and Kazuhiro Matsui, Aichi, both of Japan, assignors to Japan Storage Battery Company Limited, Kyoto and Proto Planning Co., Aichi, both of, Japan
Filed Dec. 31, 1981, Ser. No. 336,213
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—61



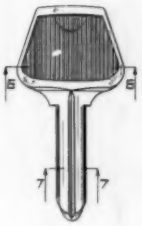
272,513
POCKET KNIFE
Masaharu Kagebayashi, No. 2-3 Higashitenma 1-chome, Kita-ku, Osaka, Japan
Filed Jun. 1, 1981, Ser. No. 268,803
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—99

272,514
LETTER OPENER
Michael Dolas, 1164 Crestline, Santa Barbara, Calif. 93105
Filed Mar. 17, 1982, Ser. No. 359,175
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—102

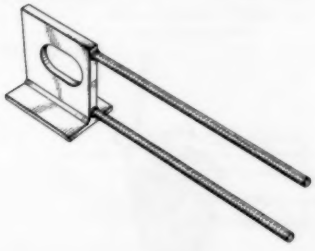
272,515
SPARE TIRE WHEEL LOCK
Charles E. Wilson, 1518 Anna Rd., Anderson, Calif. 96007
Filed Nov. 9, 1981, Ser. No. 319,855
Term of patent 14 years
Int. Cl. D8—*07*
U.S. Cl. D8—331



272,516
KEY BLANK
Richard J. Ohno, Branford, Conn., assignor to Walter Kidde & Company, Inc., New Haven, Conn.
Filed Jun. 3, 1981, Ser. No. 269,771
Term of patent 14 years
Int. Cl. D8—*07*
U.S. Cl. D8—347



272,517
COMBINATION LIFT INSERT AND WELD PLATE FOR USE IN HOLLOW CORE CONCRETE PLANKS
Richard R. Koehn, Prior Lake, Minn., assignor to Fabcon, Inc., Savage, Minn.
Filed Jun. 15, 1981, Ser. No. 273,476
Term of patent 14 years
Int. Cl. D8—*08, 06;* D25—*99*
U.S. Cl. D8—349



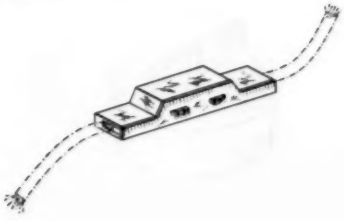
272,518
STRETCH CORD FASTENER
Eldon Smith, 526 Symmes Rd., Fairfield, Ohio 45014
Filed Jul. 7, 1981, Ser. No. 281,109
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—382

272,519
JAR
Anthony Fenimore, 172 W. Merrick Rd., Merrick, N.Y. 11566
Filed Aug. 10, 1981, Ser. No. 291,365
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—316

272,520
JAR
Anthony Fenimore, 172 W. Merrick Rd., Merrick, N.Y. 11566
Filed Aug. 10, 1981, Ser. No. 291,367
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—316

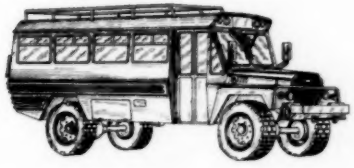
272,521
CONTAINER FOR LIQUIDS
Randy S. Glenn, Ann Arbor, Mich., assignor to Hoover Universal, Inc., Ann Arbor, Mich.
Filed Sep. 8, 1981, Ser. No. 300,088
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—370

272,522
CASE FOR THERMOSTATIC ELEMENT
Omar Givler, North Canton, Ohio, assignor to Portage Electric Products, Inc., Canton, Ohio
Filed Feb. 18, 1982, Ser. No. 350,129
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—50

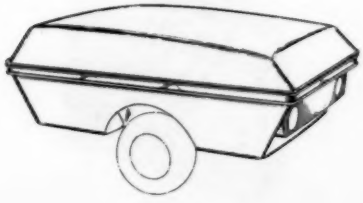


272,523
CHRISTMAS BELL
Cheng-Chieh P'eng, No. 17, Alley 50, La. 245, Chung Ching Rd., Pan Chiao, Taipei, Taiwan
Filed Feb. 23, 1981, Ser. No. 236,974
Term of patent 14 years
Int. Cl. D10—*06*
U.S. Cl. D10—116

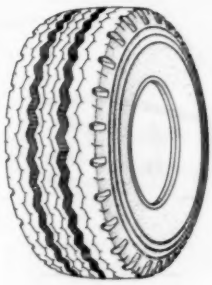
272,524
AIR TRANSPORTABLE BUS
Paul Legueu, Pornichet, France, assignor to Ateliers de Constructions Mecanizues de L'Atlantique Acmat, Saint Nazaire, France
Filed Sep. 23, 1980, Ser. No. 189,912
Claims priority, application France, Mar. 25, 1980, 800967
Term of patent 14 years
Int. Cl. D12—*08*
U.S. Cl. D12—84



272,525
TRAILER BODY
Michael G. Paulina, 6731 Guildford, Utica, Mich. 48078
Filed Dec. 5, 1980, Ser. No. 213,352
Term of patent 14 years
Int. Cl. D12—*10*
U.S. Cl. D12—102

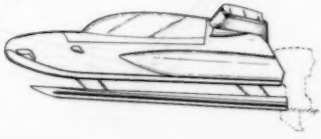


272,526
TIRE
Miroslav M. Manestar, Norton, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio
Filed Jan. 27, 1982, Ser. No. 342,999
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—142

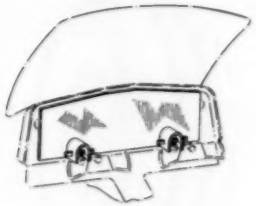


272,527
LEVER, PARTICULARLY FOR MOTORCYCLES
Michael H. Worzek, Rte. 5, Box 124, and Bruce Holmquist, Rte. 10, both of McMinnville, Tenn. 37110
Filed Apr. 8, 1981, Ser. No. 252,142
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D12—179

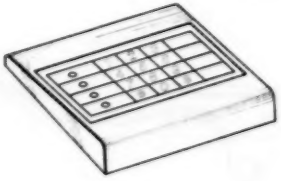
272,528
WATERCRAFT WITH HULL, CENTER HYDROPLANE AND WING
Gregory A. Ward, 602 Calle Ganadero, San Clemente, Calif. 92672
Filed Nov. 9, 1981, Ser. No. 319,134
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D12—309



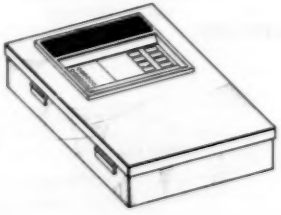
272,529
COMBINED PROTECTIVE SHIELD FOR AIRCRAFT INSTRUMENT PANEL AND LOCKING DEVICE FOR AIRCRAFT CONTROLS
Michael Marseria, 2679 Brady Ct., Santa Clara, Calif. 95051
Filed Apr. 6, 1981, Ser. No. 251,482
Term of patent 14 years
Int. Cl. D12—*07*
U.S. Cl. D12—345



272,530
CONTROL PANEL
H. Patrick Thornton, Acton; Hugh D. Dyer, Norton, and Frank R. Keeler, Needham, all of Mass., assignors to American District Telegraph Company, New York, N.Y.
Filed Nov. 13, 1981, Ser. No. 321,121
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—35

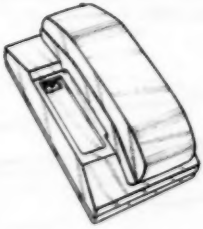


272,531
CONTROL PANEL
H. Patrick Thornton, Acton; Hugh D. Dyer, Norton, and Frank R. Keeler, Needham, all of Mass., assignors to American District Telegraph Company, New York, N.Y.
Filed Nov. 13, 1981, Ser. No. 321,123
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—35



272,532
MICROPHONE STAND DETACHABLE TRAY OR THE LIKE
Marcel Fitzner, 1672 Cerro Gordo, and V. Paige Pinnell, Jr., P.O. Box 2894, both of Santa Fe, N. Mex. 87501
Filed Jun. 15, 1981, Ser. No. 273,345
Term of patent 14 years
Int. Cl. D14—*99*
U.S. Cl. D14—13

272,533
COMBINED TELEPHONE HANDSET AND BASE STATION THEREFOR
John C. Coons, and Jean M. Beirise, both of Cincinnati, Ohio, assignors to Masco Corporation of Indiana, Taylor, Mich.
Filed May 1, 1981, Ser. No. 259,605
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—53



272,534
FAMILY PAGER RECEIVER DEVICE OR SIMILAR ARTICLE

Ka W. Wong, Kgau Tau Kok, China, and Albert K. H. Au, Wanchai, Hong Kong, assignors to Mattel, Inc., Hawthorne, Calif.

Filed Dec. 30, 1981, Ser. No. 335,967
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—68

272,535
PORTABLE RADIO RECEIVER

Peter H. J. Van De Ven, Valkenswaard, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 28, 1981, Ser. No. 306,063
Claims priority, application United Kingdom, Apr. 27, 1981, 1000153
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—70

272,536
PORTABLE RADIO RECEIVER

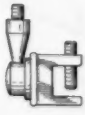
Takuji Kaneko, Nara, Japan, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 17, 1981, Ser. No. 293,757
Claims priority, application United Kingdom, Mar. 11, 1981, 999360
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—71

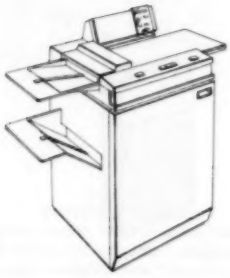
272,537
ANTENNA MOUNT

Helmut Spycher, Klosterstrasse 40, CH-5430 Wettingen, Switzerland

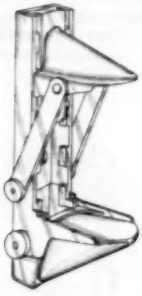
Filed Oct. 13, 1981, Ser. No. 310,892
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—91



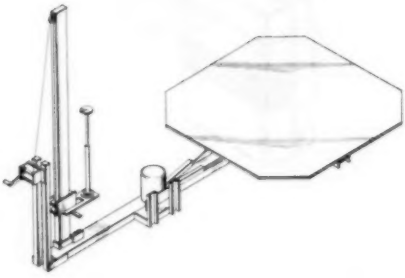
272,538
FACSIMILE TRANSCEIVER
Manzo Yoshihama, and Fumiyo Kojima, both of Kanagawa, Japan, assignors to Ricoh Company, Ltd., Japan
Filed Jul. 31, 1981, Ser. No. 288,677
Claims priority, application Japan, Feb. 2, 1981, 56-3618
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—94



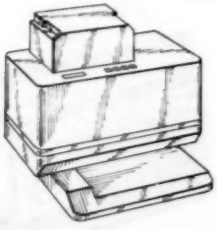
272,539
CAN COMPACTOR
Robert G. Salatka, Phoenix, Ariz., assignor to Jawz, Inc., Fallbrook, Calif.
Filed Jan. 2, 1981, Ser. No. 222,023
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D15—123



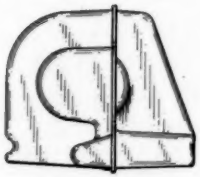
272,540
MACHINE FOR STRETCH FILM WRAPPING OF PALLETIZED LOADS
Joseph Goldstein, 1325 Southwind Cir., Westlake Village, Calif. 91361
Filed Aug. 27, 1981, Ser. No. 297,064
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D15—145



272,541
IDENTIFICATION CAMERA FOR EXPOSING X-RAY FILMS WITH DATA OF PATIENTS
Norbert Schlagheck, Fürstenfeldbruck, and Lutz Rabold, Söcking, both of Fed. Rep. of Germany, assignors to AGFA-GEVAERT AG, Leverkusen, Fed. Rep. of Germany
Filed Dec. 12, 1980, Ser. No. 216,603
Claims priority, application Fed. Rep. of Germany, Jun. 12, 1980, 5MR588-G176/80
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D16—02

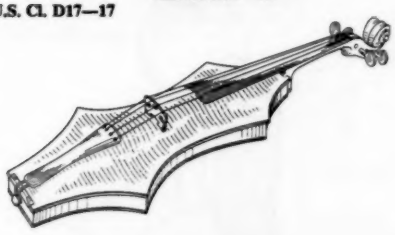


272,542
PHOTOGRAPHIC SHEET MATERIALS CASSETTE
Gary E. Raymond, 755 S. Rainbow Dr., Hollywood, Fla. 33021
Filed Nov. 30, 1981, Ser. No. 326,121
Term of patent 14 years
Int. Cl. D16—*99*
U.S. Cl. D16—32

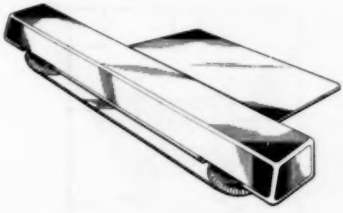


272,544
RIBBON CARTRIDGE
James R. Daughters, Danville, Calif., assignor to Wordex, Hayward, Calif.
Filed May 26, 1981, Ser. No. 267,107
Term of patent 14 years
Int. Cl. D18—*99*
U.S. Cl. D18—12

272,543
STRINGED MUSICAL INSTRUMENT
Richard Armin, 109 Vaughan Rd., Toronto, Ontario, Canada
Filed Aug. 6, 1981, Ser. No. 290,678
Claims priority, application Canada, Feb. 13, 1981, 1302818
Term of patent 14 years
Int. Cl. D17—*03*
U.S. Cl. D17—17



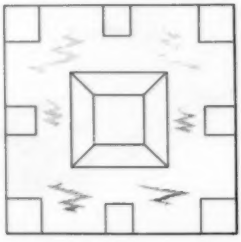
272,545
WRIST SUPPORT FOR USE WITH A KEYBOARD, TYPEWRITER OR SIMILAR ARTICLE
Richard M. Latino, Worcester, Mass., assignor to Wright Line Inc., Worcester, Mass.
Filed Aug. 31, 1981, Ser. No. 298,135
Term of patent 14 years
Int. Cl. D18—*99*
U.S. Cl. D18—12



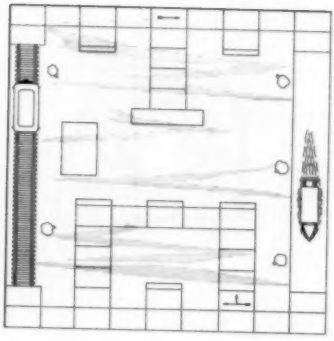
272,546
STORAGE CONTAINER FOR PHOTOGRAPHIC PRINTS
Sheldon Holson, Norwalk, Conn., assignor to The Holson Company, Wilton, Conn.
Filed Sep. 10, 1981, Ser. No. 300,806
Term of patent 14 years
Int. Cl. D19—*04*
U.S. Cl. D19—26

272,547
COPY HOLDER
Dave R. Gordon, c/o 305 - 456 W. Broadway, Vancouver, British Columbia, Canada (V5Y 1R3)
Filed Jan. 27, 1982, Ser. No. 343,387
Claims priority, application Canada, Oct. 7, 1981, 0710813
Term of patent 14 years
Int. Cl. D19—*02*
U.S. Cl. D19—91

272,548
GAME BOARD
Eric Nathanson, 2618 Batchelder St., Brooklyn, N.Y. 11235
Filed Feb. 1, 1982, Ser. No. 344,362
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—34



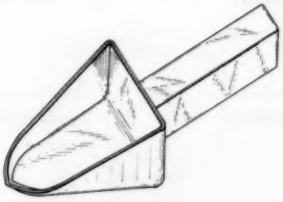
272,549
GAME BOARD
David M. Ouellette, 19 Mt. Hope St., Lowell, Mass. 01852
Filed Mar. 20, 1981, Ser. No. 245,737
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—36



272,550
RATTLE
Umberto D. Esposti, 2nd & South Sts., Philadelphia, Pa. 19147
Filed May 1, 1981, Ser. No. 259,478
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—65

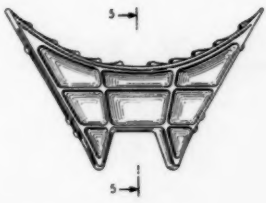
272,551
TOY VEHICLE
Shinroku Nakao, Kanagawa; Yoshiyasu Ishii, Tokyo; Susumu Matsumoto, Tokyo, and Kiyoshi Hoshino, Tokyo, all of Japan, assignors to Combi Co., Ltd., Tokyo, Japan
Filed Feb. 10, 1982, Ser. No. 347,593
Claims priority, application Japan, Aug. 10, 1981, 56-35199
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—70

272,552
TOY SHOVEL
W. Porter Clanton, East Aurora, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.
Filed Dec. 21, 1981, Ser. No. 332,452
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—120



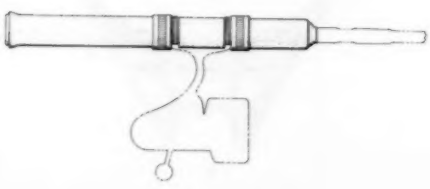
272,553
SQUASH RACKET
Harleston J. Hall, Jr., Princeton; Drew J. Yuhas, Pennington; Frank J. Duggan, Trenton, and Thomas Johnson, Hopewell, all of N.J., assignors to AMF Incorporated, White Plains, N.Y.
Filed Sep. 23, 1981, Ser. No. 304,714
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—212

272,554
GAME BALL RACKET THROATPIECE
Thomas Johnson, Hopewell, N.J., and Paul A. Witte, New Hope, Pa., assignors to AMF Incorporated, White Plains, N.Y.
Filed Jan. 6, 1982, Ser. No. 336,257
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—212

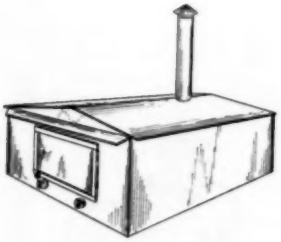


272,555
SKATE BLADE
Matti V. Näsineva, Kuismantie 8 b, 33800 Tampere 80, Finland
Continuation-in-part of Ser. No. 225,149, Jan. 15, 1981, abandoned. This application May 21, 1981, Ser. No. 265,970
Claims priority, application Finland, Jul. 17, 1980, 526/80
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—225

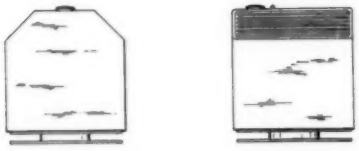
272,556
FISHING ROD HANDLE
Robert L. McMickle, and James T. Rumbaugh, both of Spirit Lake, Iowa, assignors to Berkley and Company, Inc., Spirit Lake, Iowa
Filed Apr. 27, 1981, Ser. No. 257,767
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—23



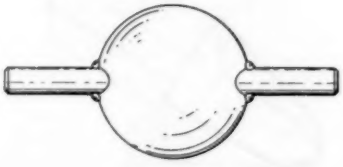
272,557
WOOD STOVE
Culbreath F. Williamson, Rte. 1, Box 166, Evergreen, N.C. 28438
Filed Feb. 22, 1982, Ser. No. 350,829
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—97



272,558
ROOM AIR IONIZER
Juergen Greubel, Hedenrod, Fed. Rep. of Germany, assignor to Igu Aktiengesellschaft, Switzerland
Filed Jul. 27, 1981, Ser. No. 286,776
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—149



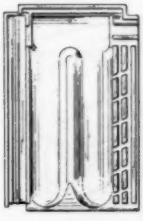
272,559
BREATH TEST MOUTH-PIECE
Richard U. Guth, 439 N. 46th St., Harrisburg, Pa. 17111
Filed Oct. 3, 1980, Ser. No. 193,642
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—17



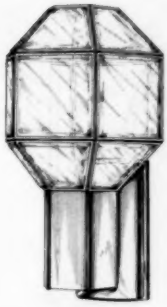
272,560
ANTERIOR SUBPERIOSTEAL IMPLANT
Albert V. Pinto, 19002 W. Dixie Hwy., North Miami Beach, Fla. 33180, and Robert B. Todd, Jr., 18 N. 4th St., Niles, Mich. 49120
Filed Oct. 19, 1981, Ser. No. 313,152
Term of patent 14 years
Int. Cl. D24—*03, 99*
U.S. Cl. D24—33

272,561
ANTERIOR SUBPERIOSTEAL IMPLANT
Albert V. Pinto, 19002 W. Dixie Hwy., North Miami Beach, Fla. 33180, and Robert B. Todd, Jr., 18 N. 4th St., Niles, Mich. 49120
Filed Oct. 22, 1981, Ser. No. 313,734
Term of patent 14 years
Int. Cl. D24—*03, 99*
U.S. Cl. D24—33

272,562
ROOF TILE
Edwardo Lopez, 841 W. 48th St., Hialeah, Fla. 33012
Filed Nov. 30, 1981, Ser. No. 325,698
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—80

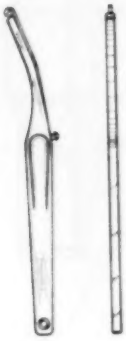


272,563
LANTERN
John W. Caldwell, 1829 Warwick Rd., San Marino, Calif. 91108
Filed Mar. 6, 1980, Ser. No. 127,880
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D26—87

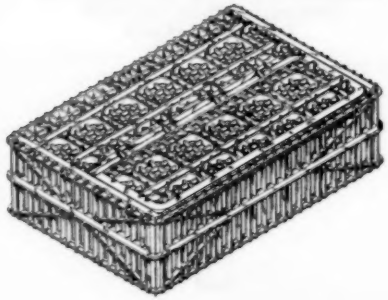


272,564
GAS LIGHTER
Alfred Racek, Seitenberggasse 54, 1160 Vienna, Austria
Filed Oct. 1, 1980, Ser. No. 192,878
Term of patent 14 years
Int. Cl. D27—*05*
U.S. Cl. D27—42

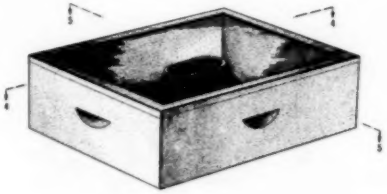
272,565
DENTAL FLOSSING INSTRUMENT
Steven K. Levine, 713 Washington St., New York, N.Y. 10014
Continuation-in-part of Ser. No. 189,867, Sep. 23, 1980, which is a continuation of Ser. No. 3,337, Jan. 15, 1979, and Ser. No. 3,338, Jan. 15, 1979, Pat. No. Des. 265,515. This application Mar. 6, 1981, Ser. No. 241,298
The portion of the term of this patent subsequent to Jul. 20, 1996, has been disclaimed.
Term of patent 14 years
Int. Cl. D24—*99*; D28—*03*
U.S. Cl. D28—64



272,566
POULTRY COOP OR SIMILAR ARTICLE
James C. Carroll, Bartlesville, Okla, and Lewis T. Johnson, deceased, late of Bartlesville, Okla., assignors to Duraco Products, Inc., Streamwood, Ill.
Filed Oct. 19, 1981, Ser. No. 313,038
Term of patent 14 years
Int. Cl. D30—*02*
U.S. Cl. D30—01

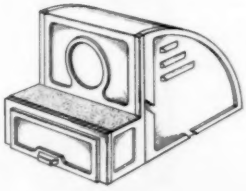


272,567
HIVE FEEDER FOR HONEY BEES
Richard C. Anderson, 48 Katydid Dr., Fox Hollow, Branchburg Township, County of Somerset, N.J. 08876
Filed May 14, 1981, Ser. No. 263,423
Term of patent 14 years
Int. Cl. D30—*03*
U.S. Cl. D30—13

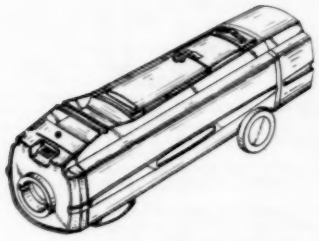


272,568
VACUUM CLEANER FOR PETS
Lynn Kuhl, 1225 Fern Lake, Brea, Calif. 92621
Filed May 11, 1981, Ser. No. 262,347
Term of patent 14 years
Int. Cl. D30—*99*
U.S. Cl. D30—40

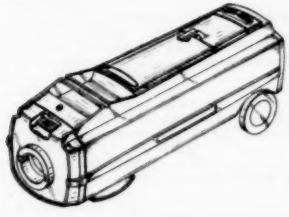
272,569
PET LITTER WINDOW BOX
Michael T. Argentine, P.O. Box 4643, Santa Barbara, Calif. 93103, and Darryl L. Enstad, 550 E. Pleasant Valley Rd., Port Hvememe, Calif. 93041
Filed Nov. 2, 1981, Ser. No. 291,991
Term of patent 14 years
Int. Cl. D30—*99*
U.S. Cl. D30—99



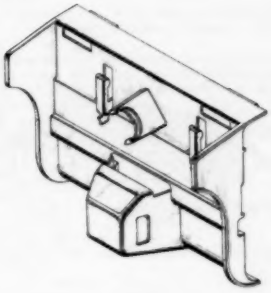
272,570
VACUUM CLEANER WITH CORD WINDER ATTACHMENT
Alfred E. Van Dyken, Trumbull; Jonn S. Tarnowski, Wilton, and George Schick, Easton, all of Conn., assignors to Electrolux Corporation, Fairfield, Conn.
Filed Feb. 25, 1981, Ser. No. 238,196
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D32—21



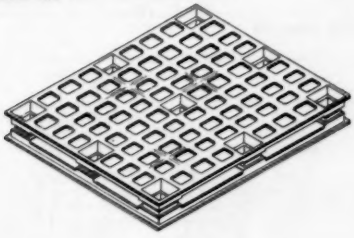
272,571
VACUUM CLEANER
John S. Tarnowski, Wilton; Alfred E. Van Dyken, Trumbull, and George Schick, Easton, all of Conn., assignors to Electrolux Corporation, Fairfield, Conn.
Filed Feb. 25, 1981, Ser. No. 238,197
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D32—21



272,572
CADDY FOR VACUUM CLEANER ATTACHMENT TOOLS
Carl Parise, Reno, Nev., assignor to Parise and Sons, Inc., Sparks, Nev.
Filed Jun. 9, 1981, Ser. No. 271,900
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D32—31

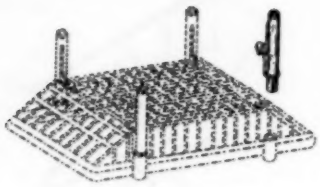


272,573
PALLET
William A. DeGironemo, 7912 W. North Ave., Elmwood Park, Ill. 60635
Filed Oct. 7, 1980, Ser. No. 194,868
Term of patent 14 years
Int. Cl. D9—*08*
U.S. Cl. D34—38

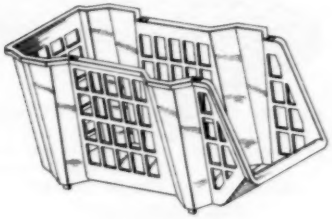


272,574
CONTAINER FOR LIQUID FUEL
Daniel E. Sprinski, 1140 Hugo St., Maumee, Ohio 43537
Filed Oct. 22, 1981, Ser. No. 313,946
Term of patent 14 years
Int. Cl. D9—*03;* D12—*02*
U.S. Cl. D34—39

272,575
SUPPORTING LEG FOR A TRAY OR THE LIKE
Giuseppe d'Imporzano, Milan, Italy, assignor to Beylerian Limited, New York, N.Y.
Filed Feb. 27, 1981, Ser. No. 239,112
Term of patent 14 years
Int. Cl. D9—*99*
U.S. Cl. D34—40



272,576
STACKING AND NESTING BIN
Max S. Klein, Hollywood, Fla., assignor to Klein Plastics Products, Inc., Baraboo, Wis.
Filed Jun. 10, 1980, Ser. No. 158,327
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D34—40



272,577
CREMAIN VAULT
Gerald A. Dercks, and Michael J. Dercks, both of 4228 Park Ave. S., Minneapolis, Minn. 55407
Filed Dec. 12, 1980, Ser. No. 216,025
Term of patent 14 years
Int. Cl. D31—*00*
U.S. Cl. D99—5

272,578
PORTABLE SUPPORT FOR A MAIL BOX
Jalmer Solyst, R.R. 1, Box 279, Forest City, Iowa 50436
Filed Aug. 31, 1981, Ser. No. 297,706
Term of patent 14 years
Int. Cl. D99—*00*
U.S. Cl. D99—43

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TO WHOM

PATENTS WERE ISSUED ON THE 7TH DAY OF FEBRUARY, 1984

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Bruns, James A., 4,429,491, Cl. 49-340.000.

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Acampora, Alfonse, to RCA Corporation. Arithmetic circuits for digital filters. 4,430,721, Cl. 364-724.000.

ACF Industries, Inc.: *See*—
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Aihara, Michiaki: *See*—
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Nelms, Robert L., 4,429,749, Cl. 168-45.000.

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Stockmaster, Edward F., 4,429,937, Cl. 339-65.000.
Thompson, William L., 4,429,582, Cl. 73-861.220.
Babsch, Alfred, to Mannesmann AG. Protection circuit for d.c. motors. 4,430,682, Cl. 361-31.000.
Bach, Erik; and Gronbjerg, Jorgen P. J., to Interlego A.G. Electrical machines constructional set. 4,430,063, Cl. 434-380.000.

Bader, Craig C., to Eldre Components, Inc. Laminated bus bar with capacitors and method of making same. 4,430,522, Cl. 174-72.00B.

Bailey, Edward A.; and LeBlanc, Louis H., Jr., to Joy Manufacturing Company. Pneumatic motor for rock drills and the like. 4,429,752, Cl. 173-59.000.

Bailey, Gene E.: *See*—
Tice, Bernard O.; and Bailey, Gene E., 4,429,477, Cl. 37-80.00R.

Bailey, Ronald J.: *See*—
Patterson, William P.; and Bailey, Ronald J., 4,430,251, Cl. 252-359.00R.

Baird Corporation: *See*—
Eldering, Herman G.; and Kliman, Arthur W., 4,430,000, Cl. 356-236.000.

Bakeman, Delbert C. Liquid storage container assembly and decanter. 4,429,811, Cl. 222-159.000.

Baker CAC, Inc.: *See*—
Furmaga, Robert E., 4,429,581, Cl. 73-861.040.

Baker, Marvin E. Pipe coupling device for receiving removably insertable valve. 4,429,903, Cl. 285-24.000.

Baker, Marvin E. Strainer mill for swimming pool pump intake. 4,430,214, Cl. 210-169.000.

Bala, Frank J., Jr.: *See*—
Pierce, Robert C.; and Bala, Frank J., Jr., 4,430,237, Cl. 252-173.000.

Bally Manufacturing Corporation: *See*—
Halliburton, Ronald D.; Pearson, James H.; and Sava, Robert J., 4,429,876, Cl. 273-121.00A.

Balstad, Edward. Assembly and disassembly of roller skate components. 4,429,449, Cl. 29-446.000.

Balz, Werner: *See*—
Melzer, Milena; Schneider, Norbert; Kopke, Helmut; Schoettle, Klaus; Koester, Eberhard; Balz, Werner; and Grau, Werner, 4,430,362, Cl. 427-48.000.

Banno, Mitsuyuki: *See*—
Utsumi, Hiroo; Sakakibara, Yukio; Ito, Teruyoshi; Iwata, Toshiharu; Ohta, Jun; Kazi, Kiyokane; Hori, Osamu; and Banno, Mitsuyuki, 4,429,565, Cl. 73-35.000.

Barber, Jerry L., to Comstock, Wayne P., a part interest. Flotation amusement device. 4,429,867, Cl. 272-32.000.

Barden Corporation, The: *See*—
Gereg, Charles V., 4,430,614, Cl. 324-238.000.

Barmag Barmer Maschinenfabrik AG: *See*—
Lenk, Erich; and Busch, Hansjochen, 4,429,838, Cl. 242-46.400.

Barrett, Kenneth A. Portable golf game. 4,429,881, Cl. 273-176.00F.

Barrett, Kenneth L.: *See*—
Alsup, James D., Jr.; Barrett, Kenneth L.; and Jenkins, Arden F., 4,429,918, Cl. 297-353.000.

Barrett, Robert E.: *See*—
Hardy, John H. M.; Barrett, Robert E.; Allwood, Anthony R.; Riley, Garth I.; Hovell, John; Smith, Donald W.; Potter, Arthur R.; and Lowrie, Ian W., 4,430,733, Cl. 370-110.100.

Barry, Leon F.: *See*—
Merck, James Q.; and Barry, Leon F., 4,430,209, Cl. 209-3.000.

Barry, Robert C.; and Rachfalski, Gary. Mass measuring system. 4,429,574, Cl. 73-580.000.

Barry Wright Corporation: *See*—
Peterson, Robert R., 4,430,065, Cl. 464-90.000.

Barton, Brandon H.; and Sagel, John A. Energy transfer. 4,430,271, Cl. 260-458.00R.

BASF Aktiengesellschaft: *See*—
Dehnert, Johannes, 4,430,267, Cl. 260-147.000.
Hack, Joachim; Brotzler, Roland; Schulze-Berge, Klaus; and Angermann, Rudolf, 4,430,678, Cl. 360-99.000.
Heinz, Gerhard; Richter, Peter; and Mueller, Wolfgang F., 4,430,417, Cl. 430-286.000.
Melzer, Milena; Schneider, Norbert; Kopke, Helmut; Schoettle, Klaus; Koester, Eberhard; Balz, Werner; and Grau, Werner, 4,430,362, Cl. 427-48.000.
Rentzea, Costin; Zeeh, Bernd; and Pommer, Ernst-Heinrich, 4,430,336, Cl. 424-272.000.

BASF Farben & Fasern AG: *See*—
Meisner, Roland; and Buchholz, Hagen, 4,429,833, Cl. 239-224.000.

BASF Farben+Fasern AG: *See*—
Meisner, Roland A., 4,430,359, Cl. 427-31.000.

BASF Wyandotte Corporation: *See*—
Austin, Arthur L.; Levis, William W., Jr.; Pizzini, Louis C.; and Hartman, Robert J., 4,430,247, Cl. 252-182.000.

Basic Line, Inc.: *See*—
Licari, Yaffa, 4,429,638, Cl. 108-25.000.

Batscheider, Alfred; and Bernasek, G. Method of cleaning grain. 4,430,357, Cl. 426-626.000.

Bauman, William C.: *See*—
Lee, John M.; and Bauman, William C., 4,430,311, Cl. 423-179.500.

Baur, Bruce K.; and Ollis, John R., to Tektronix, Inc. Charge-pump glitch filter. 4,430,641, Cl. 340-347.0DA.

Baverstock, John R., to Lucas Industries Limited. Apparatus for manufacturing cable. 4,430,139, Cl. 156-353.000.

Baxter Travenol Laboratories, Inc.: *See*—
Mittleman, Herbert; and Rush, William L., 4,430,077, Cl. 604-111.000.

Bayer Akiengesellschaft: *See*—
Alfes, Franz; Perrey, Hermann; Meyer, Karl-Heinrich; Heine, Diez; and Kowitz, Friedrich, 4,430,483, Cl. 525-356.000.

Bayer Aktiengesellschaft: *See*—
Buysch, Hans-Josef; Illiger, Hans-Walter; and Dorner, Karl H., 4,430,452, Cl. 521-107.000.

Casper, Clemens; Grenner, Dieter; Klette, Gerd-Rudiger; and Tholema, Edzard, 4,430,156, Cl. 159-47.100.

Findeisen, Kurt, 4,430,503, Cl. 556-417.000.

Heitkamper, Peter; Konig, Klaus; Findeisen, Kurt; Fauss, Rudolf; and Sundermann, Rudolf, 4,430,505, Cl. 560-24.000.

Ippen, Jakob; and Stuttgen, Friedel, 4,429,728, Cl. 152-209.00A.

Krist, Otto; Drave, Heinz; and Luypaert, Jozef, 4,430,438, Cl. 501-17.000.

Neumann, Rainer; Morgenstern, Karl; Lipper, Karl-August; Bruhne, Friedrich; Bockmann, Walter; Casper, Clemens; and Zingel, Siegfried, 4,430,181, Cl. 204-158.0HA.

Reuter, Knud; and Dhein, Rolf, 4,430,504, Cl. 556-482.000.

Schreckenberg, Manfred; Burgdorfer, Hans-Heribert; Dhein, Rolf; and Schneider, Gottfried, 4,430,492, Cl. 528-176.000.

Seifert, Peter; and Haas, Peter, 4,430,453, Cl. 521-107.000.

Beale, William T., to Sunpower, Inc. Hermetically sealed transmission system for a free piston Stirling engine. 4,429,530, Cl. 60-520.000.

Beattie, Ian A. M., to Internationale Octrooi Maatschappij "Octropa" B.V. Soap composition. 4,430,245, Cl. 252-117.000.

Beattie, Norman W.; and Nyberg, Donald W., to Hawker Siddeley Canada, Inc. Apparatus for spraying liquids such as resins and waxes on surfaces of particles. 4,430,003, Cl. 366-173.000.

Beauger, Alain: *See*—
Lagrange, Alain; and Beauger, Alain, 4,430,689, Cl. 361-321.000.

Bechara, Ibrahim S.; and Mascioli, Rocco L., to Air Products and Chemicals, Inc. Polyurethane-forming process using amino and amido dialkyl tin carboxylates. 4,430,456, Cl. 521-128.000.

Bechtold, Dieter, to Varta Batterie Aktiengesellschaft. Separator for storage battery. 4,430,394, Cl. 429-147.000.

Beck, Harold K., to Halliburton Company. Low pressure responsive APR tester valve. 4,429,748, Cl. 166-324.000.

Beck, Richard D.; and Steketee, Campbell H., Jr. Apparatus for seeking out and repairing leaks in pipes. 4,429,720, Cl. 138-97.000.

Beckers, Hans; and Vollmer, Klaus, to Robert Bosch GmbH. Apparatus for enclosing objects. 4,429,513, Cl. 53-547.000.

Becton, Dickinson and Company: *See*—
Pasquini, Richard J.; Brown, Harold; and Kostiuk, Alan, deceased, 4,430,080, Cl. 604-240.000.

Bedenbender, John W.; Cook, Marvin C.; and Johnston, Otis A., to Mertz, Inc. Suspension assembly for seismic exploration vehicle. 4,429,898, Cl. 280-678.000.

Beebe, George W.; Hine, Philip; O'Bryan, Nelson B.; and Shor, Steven M., to Minnesota Mining and Manufacturing Company. Stabilization of silver halide emulsions. 4,430,426, Cl. 430-604.000.

Beedle, Richard: *See*—
Weber, Karl; Schlinger, Michael; and Beedle, Richard, 4,429,850, Cl. 248-250.000.

Beitel, James E.; Bruce, Charles R.; Cook, Gary R.; Mosier, Charles F., Jr.; and Sartore, Edward L., to Marathon Oil Company. Computer terminal security system. 4,430,728, Cl. 364-900.000.

Bell Helicopter Textron, Inc.: *See*—
Cresap, Wesley L., 4,430,045, Cl. 416-138.000.

Bell & Howell Company: *See*—
Mischenko, Nicholas, 4,429,963, Cl. 353-88.000.

Bell, Joseph P. Battery post clamp. 4,429,944, Cl. 339-228.000.

Bell Telephone Laboratories, Incorporated: *See*—
Boyd, Gary D.; and Ngo, Peter D. T., 4,430,601, Cl. 315-169.400.
Brown, Earl F.; and Larsen, Arthur B., 4,430,526, Cl. 178-18.000.
D'Altroy, Frederick A.; and Lindner, Richard, 4,430,663, Cl. 357-53.000.
Hubbard, William M., 4,430,734, Cl. 370-112.000.
Kasday, Leonard R., 4,430,726, Cl. 364-900.000.
Kirk, Edward W., Jr., 4,430,585, Cl. 307-473.000.
Netravali, Arun N., 4,430,670, Cl. 358-135.000.
Shoji, Masakazu, 4,430,583, Cl. 307-448.000.
Yan, Man F., 4,430,255, Cl. 252-512.000.

Bemis Manufacturing Company: *See*—
Bemis, Peter F.; and Swart, Gerald W., 4,430,073, Cl. 604-48.000.

Bemis, Peter F.; and Swart, Gerald W., to Bemis Manufacturing Company. Surgical suction probe with reversible valve. 4,430,073, Cl. 604-48.000.

Benassi, Mario, to RIV-SKF Officine Di Villar Perosa S.p.A. Resiliently supported connection unit for joining a transmission shaft to a transmission coupling element. 4,430,066, Cl. 464-178.000.

Bendix Corporation, The: *See*—
Roberts, James K., 4,429,772, Cl. 188-328.000.
Taig, Alistair G., 4,429,777, Cl. 192-111.00A.

Benker, Klaus: *See*—
Schmitt, Burghard; Benker, Klaus; Priebe, Edmund; and Lindenschmidt, Gerhard, 4,430,478, Cl. 525-71.000.

Bennett, Dale L., to Benvar Associates, c/o Dale Bennett. Visual message intercommunication unit and system. 4,430,639, Cl. 340-310.00A.

Bennett, John E.; and Harney, David E., to Diamond Shamrock Corporation. Metal amalgams for sodium-sulfur battery systems. 4,430,393, Cl. 429-101.000.

Bensley, Douglas W. Article of footwear. 4,429,475, Cl. 36-45.000.

Bentall, Richard H. C. High frequency electromagnetic therapy apparatus. 4,429,698, Cl. 128-422.000.

Benton, Stephen A., to Polaroid Corporation. Reflection mount for transmission holograms. 4,429,947, Cl. 350-3.850.

Benvar Associates, c/o Dale Bennett: *See*—
Bennett, Dale L., 4,430,639, Cl. 340-310.00A.

Benzing, Rolf, to Metabowerke GmbH & Co. Overload protection arrangement for an electric motor, especially of a hand-held power tool. 4,430,681, Cl. 361-27.000.

Beranger, Herve; and Brunin, Armand, to International Business Machines Corporation. Exclusive or circuit and parity checking circuit incorporating the same. 4,430,737, Cl. 371-49.000.

Berg, Samuel; and Solver, Carl E., to ASEA Aktiebolag. Damping device for electric circuit breakers. 4,430,535, Cl. 200-82.00R.

Berger, Jean Luc, to Thomson CSF. Photosensitive device read by charge transfer. 4,430,672, Cl. 358-213.000.

Bergwerksverband GmbH: *See*—
Ackermann, Manfred; Kohling, Rolf; and Leininger, Dieter, 4,430,126, Cl. 106-97.000.

Berkman, Samuel, to RCA Corporation. Chemical vapor deposition of epitaxial silicon. 4,430,149, Cl. 156-613.000.

Berkowitz, Sidney: *See*—
Castrantas, Harry M.; and Berkowitz, Sidney, 4,430,454, Cl. 521-107.000.

Bernasek, G.: *See*—
Batscheider, Alfred; and Bernasek, G., 4,430,357, Cl. 426-626.000.

Berol Kemi AB: *See*—
Hellsten, Karl M. E.; and Klingberg, Anders W., 4,430,238, Cl. 252-61.000.

Bert, Alain; and Kaminsky, Didier, to Thomson-CSF. Monolithic amplifier comprising a power division and recombination system grouping a plurality of transistors. 4,430,623, Cl. 330-286.000.

Bertozzi, Eugene R.: *See*—
MacMillan John H.; Bertozzi, Eugene R.; and Streeter, Bruce E., 4,430,489, Cl. 528-45.000.

Berube, Richard G., to King Instrument Corporation. Splicer presser pad. 4,430,145, Cl. 156-497.000.

Bethge, Horst; Drauz, Karlheinz; Kleemann, Axel; Martens, Jurgen; and Weigel, Horst, to Degussa Aktiengesellschaft. Process for the separation of the racemate (R,S)-cysteine. 4,430,509, Cl. 562-401.000.

Bethlehem Steel Corporation: *See*—
Early, John D., 4,429,641, Cl. 110-181.000.
Schaeffer, Charles W., 4,429,560, Cl. 72-328.000.

Betts, Colin R., to Post Office. Digital data transmission. 4,430,745, Cl. 375-25.000.

Betz Laboratories, Inc.: *See*—
Niu, Joseph H. Y., 4,430,196, Cl. 208-47.000.

Betzl, Hermann; Mageri, Johann; and Volejnik, Wilhelm, to Siemens Aktiengesellschaft. Electrical filter circuit operated with a definite sampling and clock frequency f_T which consists of CTD elements. 4,430,629, Cl. 333-165.000.

Betzler, Otto, to Michael Weinig GmbH & Co. KG. Machine for carrying out milling, planing, and similar operations. 4,429,726, Cl. 144-134.00R.

Bey, Henry A., to Bey, Lena. Sleeve type door securing device. 4,429,913, Cl. 292-293.000.

Bey, Lena: *See*—
Bey, Henry A., 4,429,913, Cl. 292-293.000.

Beyer, William F.; Dankert, Harry S.; and English, James C., to Upjohn Company, The. Microprocessor controllable automatic sampler. 4,429,584, Cl. 73-864.210.

Bez, Ulrich; Schroder, Gerhard; and Rauser, Richael, to Dr. Ing.h.c.F. Porsche AG. Support system for the body of a motor vehicle, especially a passenger car. 4,429,914, Cl. 296-188.000.

Bhatti, Mohinder S.; and Marzocchi, Alfred, to Owens-Corning Fiberglas Corporation. Method and apparatus for forming glass fibers. 4,430,105, Cl. 65-1.000.

BHS-Bayerische Berg, Hutten-und Salzwerke Aktiengesellschaft: *See*—
Dopfer, Maximilian; and Heidrich, Gunther, 4,429,586, Cl. 74-410.000.

Bickel, Hans: *See*—
Heusler, Karl; Bickel, Hans; Fechtig, Bruno; Peter, Heinrich; and Scartazzini, Riccardo, 4,430,498, Cl. 544-16.000.

Bielfeldt, Friedrich B., to Maschinenfabrik J. Dieffenbacher GmbH & Co. Injection press. 4,430,059, Cl. 425-190.000.

Biery, Galen A., Jr.: *See*—
Rothenbuhler, Dan E.; and Biery, Galen A., Jr., 4,430,652, Cl. 340-825.690.

Bill, Robert C.; and Wisander, Donald W., to United States of America, National Aeronautics and Space Administration. Method of fabricating an abradable gas path seal. 4,430,360, Cl. 427-34.000.

Billard, Jean; Dubois, Jean-Claude; Hareng, Michel; Le Berre, Serge; and Perbet, Jean-Noel, to Thomson-CSF. Display process using a thermo-optical effect with a memory in a thin disc-like liquid crystal layer and disc-like liquid crystals having such an effect. 4,430,650, Cl. 340-784.000.

Bimberg, Dieter H.; Bubenzer, Achim; Dransfeld, Klaus F. K.; and Hunklinger, Siegfried. Method for calorimetric absorption spectroscopy and device for working the method. 4,429,999, Cl. 356-432.000.

Biofarma: *See*—
Servier, Jacques P., 4,430,431, Cl. 435-171.000.

Bisiach, Luciano. Industrial robot with several axes of rotation. 4,430,037, Cl. 414-4.000.

Bjornstad, Arne, to Minilife A/S. Construction and method for models with interlocking tab/slot assembly. 4,429,486, Cl. 46-21.000.

Blair, Lyndia S., to Merck & Co., Inc. Synergistic treatment of adult canine heartworm with thiacetarsamide and ivermectin. 4,430,329, Cl. 424-181.000.

Blake, Joseph W., III, to Kinberg, Kenjamin. Sound motion picture apparatus with removable cartridge. 4,429,962, Cl. 352-32.000.

Blake, Larry W.; Harvel, Ervin R.; Mason, Duane R.; and Wright, George M. Surgical fluid evacuator. 4,429,693, Cl. 604-73.000.

Blanchard, Raymond A., Jr.; and Garey, Kenneth E., to SCM Corporation. Encoding apparatus having an acoustic member with mirror-image tabs. 4,430,644, Cl. 340-365.00R.

Blasko, Jan: *See*—
Ferkl, Frantisek; Cap, Antonin; Vecera, Milos; Skala, Josef; Kopriva, Vaclav; Blasko, Michal; Pavek, Karel; Chrtek, Milan; and Blasko, Jan, 4,429,522, Cl. 57-301.000.

Blasko, Michal: *See*—
Ferkl, Frantisek; Cap, Antonin; Vecera, Milos; Skala, Josef; Kopriva, Vaclav; Blasko, Michal; Pavek, Karel; Chrtek, Milan; and Blasko, Jan, 4,429,522, Cl. 57-301.000.

Blau, Monte; Kung, Hank F.; and Tramposch, Kenneth M., to State University of New York. Radioactive iodine labeled phenolic amines. 4,430,319, Cl. 424-1.100.

Blazejewski, Theodore E., to Ingersoll-Rand Company. Rotary, positive-displacement machine. 4,430,050, Cl. 418-191.000.

Blickenstaff, Ronald L.: *See*—
Coulson, Richard L.; Blickenstaff, Ronald L.; Dodd, P. David; Moreno, Robert J.; and Kinard, Dean P., 4,430,712, Cl. 364-300.000.

Bliss, Douglas: *See*—
Jacobson, Walter E.; and Bliss, Douglas, 4,429,756, Cl. 177-211.000.

Bloess, J. J. Distillate oil moisture dehazing process. 4,430,202, Cl. 208-187.000.

Blomgren, Roland A.: *See*—
Copeland, William M.; Blomgren, Roland A.; and Shallenberg, Robert L., 4,429,432, Cl. 15-320.000.

Blouin, Joseph L. D. C., to Nightingale Saro Inc. Interlock for drawers. 4,429,930, Cl. 312-216.000.

Blumenstein, Kenneth. Attractive ladies heeled shoe. 4,429,473, Cl. 36-11.500.

Bobsein, Rex L., to Phillips Petroleum Company. Catalyst compositions. 4,430,515, Cl. 585-530.000.

Boc-Nowsco Limited: *See*—
Armell, Richard A.; and Misselbrook, John G., 4,429,566, Cl. 73-40.700.

Bockmann, Walter: *See*—
Neumann, Rainer; Morgenstern, Karl; Lipper, Karl-August; Bruhne, Friedrich; Bockmann, Walter; Casper, Clemens; and Zingel, Siegfried, 4,430,181, Cl. 204-158.0HA.

Boctor, Wassief M.: *See*—
Testa, Rene B.; and Boctor, Wassief M., 4,429,580, Cl. 73-768.000.

Boden, Richard M.; and Tyszkiewicz, Theodore J., to International Flavors & Fragrances Inc. Branched chain ketones and uses thereof in augmenting or enhancing the aroma of perfumes, colognes and perfumed articles and the process for preparing same. 4,430,233, Cl. 252-8.600.

Boden, Richard M.; Tyszkiewicz, Theodore J.; Licciardello, Michael; Vock, Manfred H.; Vinals, Joaquin F.; Whalen, Patrick; and Hanna, Marie R., to International Flavors & Fragrances Inc. Flavoring with heliotropyl methyl carboonate. 4,430,354, Cl. 426-536.000.

Bodine, Albert G. Well servicing system employing sonic energy transmitted down the pipe string. 4,429,743, Cl. 166-177.000.

Boehlke, Horst R. E.: *See*—
Vollenberg, Werner P.; and Boehlke, Horst R. E., 4,430,497, Cl. 542-429.000.

Boehringer, Wilfred E., to McDonnell Douglas Corporation. Hydraulic power transfer unit. 4,429,707, Cl. 137-625.210.

Boeing Company, The: *See*—
Brown, Stephen T.; and Statkus, Frank D., 4,429,844, Cl. 244-219.000.
Jones, Everett E., 4,429,658, Cl. 118-711.000.

Bogdanov, Todor D.: *See*—
Jelezov, Jivko Y.; and Bogdanov, Todor D., 4,429,821, Cl. 226-181.000.

Boidron, Michel. Open fire convector. 4,429,680, Cl. 126-121.000.

Boland, Thomas J., to United States of America, Energy. Frequency spectrum analyzer with phase-lock. 4,430,611, Cl. 324-77.00C.

Bonis, Laszlo J., to Composite Container Corporation. Making coextruded sheets and containers. 4,430,288, Cl. 264-510.000.

Bonnet, Christian: *See*—
de Sivry, Bruno J. M.; Carsac, Claude R.; and Bonnet, Christian, 4,430,550, Cl. 219-121.0ED.

Borg-Warner Corporation: *See*—
Lamarche, Paul E., 4,430,064, Cl. 464-64.000.

Bork, Klaus; Humbs, Rolf; and Trey, Karl, to Siemens Aktiengesellschaft. Device for contacting tubular piezo-electric transducers. 4,430,594, Cl. 310-328.000.

Borkoski, Paul J.: *See*—
Stover, John C.; and Borkoski, Paul J., 4,429,845, Cl. 246-428.000.

Borows, Allan A. Protected glass jar with closure. 4,429,798, Cl. 215-12.00R.

Bos, Alfred M.: *See*—
Frampton, William H.; and Bos, Alfred M., 4,429,892, Cl. 280-407.000.

Bosch-Siemens Hausgerate GmbH: *See*—
Waigand, Helmut, 4,430,578, Cl. 307-115.000.

Bose, Bidyut K.; and Jorgensen, John M., to National Semiconductor Corporation. Fast CMOS buffer for TTL input levels. 4,430,582, Cl. 307-297.000.

Bottoms, Norman, to International Computers Limited. Cable clamping arrangement for an electrical connector. 4,429,941, Cl. 339-103.00M.

Boucherie, Leonel P., to G.B. Boucherie, Firma. Fibre loading device for a brush manufacturing machine. 4,430,039, Cl. 414-417.000.

Boudot, Bernard; Nury, Georges; and Lambert, Andre, to Rhone-Poulenc Specialties Chimiques. Additive composition, bath and process for acid cooper electroplating. 4,430,173, Cl. 204-52.00R.

Bouquet, Gerard, to Commissariat a l'Energie Atomique. High voltage electromagnetic pulse generator. 4,430,577, Cl. 307-108.000.

Bousgarbies, Jacques, to Airwick Industries, Inc. Device for the metered release of an active ingredient. 4,429,809, Cl. 222-67.000.

Bowman, Donald B.; Filz, Charles J.; and Osborn, James G. Apparatus for degassing hemodialysis liquid and the like. 4,430,098, Cl. 55-191.000.

Box, Leonard J. Glass-to-metal compression sealed lead-in structure. 4,430,376, Cl. 428-174.000.

Boyd, Gary D.; and Ngo, Peter D. T., to Bell Telephone Laboratories, Incorporated. Selective shifting AC plasma panel. 4,430,601, Cl. 315-169.400.

Boyes, David, to Gerhard Kosche. Wood veneers. 4,430,371, Cl. 428-61.000.

Boylan, David R.; and Hug, Mansur U., to Iowa Limestone Company. Process for pelletizing limestone fines. 4,430,281, Cl. 264-118.000.

Brackett, Raymond B.: *See*—
Page, Robert E.; and Brackett, Raymond B., 4,430,704, Cl. 364-200.000.

Bradbury, Ronald C.: *See*—
Nappholz, Tibor A.; Bradbury, Ronald C.; and Satchwell, Bruce R., 4,429,697, Cl. 128-419.0PG.

Bragg, Charles D., to Procter & Gamble Company, The. Bleach catalyst compositions and use thereof in laundry bleaching and detergent compositions. 4,430,243, Cl. 252-91.000.

Brand, Peter: *See*—
Koch, Franz P.; Helms, Adolf; Siems, Wolfgang; and Brand, Peter, 4,429,567, Cl. 73-49.800.

Brandenstein, Manfred: *See*—
Olschewski, Armin; Brandenstein, Manfred; Kunkel, Heinrich; Hetterich, Hermann; Horling, Peter; and Walter, Lothar, 4,429,926, Cl. 308-216.000.

Bratten, Jack. Filtering apparatus and method. 4,430,231, Cl. 210-783.000.

Braun, Jimmy E.: *See*—
Anderson, Jared A.; Van Gelder, Robert V.; Yazolino, Lauren F.; and Braun, Jimmy E., 4,430,711, Cl. 364-200.000.

Bregman, Marvin D.: *See*—
Hruby, Victor J.; and Bregman, Marvin D., 4,430,326, Cl. 424-177.000.

Brennan, V. Jack. Desk top organizer. 4,429,932, Cl. 312-259.000.

Breza, Michael J.: *See*—
Lesniewski, Joseph M.; and Breza, Michael J., 4,430,467, Cl. 524-89.000.

Brink Locking Systems, Inc.: *See*—
Kambic, Raymond V., 4,429,556, Cl. 70-149.000.

Brinkmann, Carl R.: *See*—
Hayes, Donald A.; Finn, Lyle D.; and Brinkmann, Carl R., 4,430,023, Cl. 405-224.000.

Bristol-Myers Company: *See*—
Umezawa, Hamao; Takeuchi, Tomio; Kondo, Shinichi; Iinuma, Hironobu; Ikeda, Daishiro; Nakamura, Teruya; and Fujii, Akio, 4,430,346, Cl. 424-311.000.

British Steel Corporation: *See*—
Spenceley, Gene D.; Davies, Mervyn W.; and Robson, Alan L., 4,430,117, Cl. 75-51.000.

Brock, Alan J.; Clements, Alwin S.; and Horrocks, Brian J. Charger for electrographic surfaces. 4,430,686, Cl. 361-229.000.

Brode, George L.; Chow, Sui-Wu; and Hale, Warren F., to Union Carbide Corporation. Composites made from thermosetting compositions containing hemiformals of phenol. 4,430,473, Cl. 524-492.000.

Brogardh, Torgny; and Sander, Lars, to ASEA Aktiebolag. Correlating fiber optical measuring device. 4,430,565, Cl. 250-227.000.

Brooks, Robert. Contained fire hose. 4,429,931, Cl. 312-228.000.

Brooks, Thomas W.: *See*—
Hill, James D., Jr; Alexander, David L.; and Brooks, Thomas W., 4,429,465, Cl. 33-174.00E.

Brotzler, Roland: *See*—
Hack, Joachim; Brotzler, Roland; Schulze-Berge, Klaus; and Angermann, Rudolf, 4,430,678, Cl. 360-99.000.

Brown, Bill H. Fuel treating device and method. 4,429,665, Cl. 123-3.000.

Brown, Boveri & Cie Aktiengesellschaft: *See*—
Gamer, Gerold, 4,430,129, Cl. 134-22.190.

Brown, Earl F.; and Larsen, Arthur B., to Bell Telephone Laboratories, Incorporated. Interactive graphics transmission system employing an adaptive stylus for reduced bandwidth. 4,430,526, Cl. 178-18.000.

Brown, Harold: *See*—
Pasquini, Richard J.; Brown, Harold; and Kostiuk, Alan, deceased, 4,430,080, Cl. 604-240.000.

Brown, Stanley M.: *See*—
Durante, Vincent A.; Olszanski, Dennis J.; Reagan, William J.; and Brown, Stanley M., 4,430,199, Cl. 208-114.000.

Brown, Stephen T.; and Statkus, Frank D., to Boeing Company, The. Variable camber aircraft wing tip. 4,429,844, Cl. 244-219.000.

Broyer, Alfred P.; and Dines, David R., to Western Electric Company, Inc. Connector terminal spreader. 4,429,454, Cl. 29-747.000.

Broze, Guy; and Laitem, Leopold, to Colgate-Palmolive Company. Silicate-free bleaching and laundering composition. 4,430,244, Cl. 252-94.000.

Bruandet, Justin: *See*—
Vachet, Joel; Bruandet, Justin; and Fremeaux, Jacques, 4,429,509, Cl. 52-788.000.

Bruce, Barbara J.: *See*—
Fraser, Thomas H.; and Bruce, Barbara J., 4,430,428, Cl. 435-68.000.

Bruce, Charles R.: *See*—
Beitel, James E.; Bruce, Charles R.; Cook, Gary R.; Mosier, Charles F., Jr.; and Sartore, Edward L., 4,430,728, Cl. 364-900.000.

Bruce, Robert L. Loop detector for traffic signal control. 4,430,636, Cl. 340-941.000.

Bruce-Sanders, James. Variable information sign. 4,429,478, Cl. 40-447.000.

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Brugger, Robert; and Schulze-Berge, Klaus, to Langbein-Pfanhauser Werke AG. Method of increasing corrosion resistance in galvanically deposited palladium/nickel coatings. 4,430,172, Cl. 204-43.00N.

Bruggmann, Remy: *See*—
Frund, Louis; and Bruggmann, Remy, 4,429,553, Cl. 66-78.000.

Bruhne, Friedrich: *See*—
Neumann, Rainer; Morgenstern, Karl; Lipper, Karl-August; Bruhne, Friedrich; Bockmann, Walter; Casper, Clemens; and Zingel, Siegfried, 4,430,181, Cl. 204-158.0HA.

Brune, Robert A., Jr.: *See*—
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Brunin, Armand: *See*—
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Bruns, James A., to Abe W. Mathews Engineering Co. Door operator apparatus. 4,429,491, Cl. 49-340.000.

Brunswick Corporation: *See*—
Staerzl, Richard E., 4,429,673, Cl. 123-491.000.

Bryant, David M.; Corbeil, Ryn C.; Malcolm, Michael A.; Rogers, Lawrence D.; and Thompson, Donald R., to Burroughs Corporation. Expandable and contractible local area network system. 4,430,651, Cl. 340-825.520.

Bubenzer, Achim: *See*—
Bimberg, Dieter H.; Bubenzer, Achim; Dransfeld, Klaus F. K.; and Hunklinger, Siegfried, 4,429,999, Cl. 356-432.000.

Bubik, Alfred; and Reutter, Siegfried, to Escher Wyss Limited. Twin-wire papermaking machine. 4,430,159, Cl. 162-292.000.

Buchholz, Hagen: *See*—
Meisner, Roland; and Buchholz, Hagen, 4,429,833, Cl. 239-224.000.

Buchwald, Holger: *See*—
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Buckeye Cellulose Corporation, The: *See*—
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Buffone, Angelo J., to ACF Industries, Inc. Hand wheel for bottom operated tank car valve. 4,429,855, Cl. 251-144.000.

Buhler, Ulrich; Hahnle, Reinhard; Ribka, Joachim; and Richter, Helmut, to Cassella Aktiengesellschaft. Process for coloring organic solvents, mineral oil products, waxes, plastics and surface coatings with cyano-nitro-amino-azo dyes. 4,430,090, Cl. 8-508.000.

Burba, John L., III, to Dow Chemical Co., The. Lithium aluminates for separating hydrocarbons. 4,430,097, Cl. 55-67.000.

Burchart, Joachim, to Nixdorf Computer AG. Money-dispensing device from a safe's space. 4,429,639, Cl. 109-19.000.

Burgdorfer, Hans-Heribert: *See*—
Schreckenberg, Manfred; Burgdorfer, Hans-Heribert; Dhein, Rolf; and Schneider, Gottfried, 4,430,492, Cl. 528-176.000.

Burge, Theodor A.; Widmer, Jurg; Meyer, Theodor; and Suiser, Ulrich, to Sika AG, vorm. Kaspar Winkler & Co. Process for preparing highly concentrated aqueous solutions of low viscosity of melamine-/aldehyde resins. 4,430,469, Cl. 524-247.000.

Burgoon, Jack L., to Scott & Fetzer Company, The. Surface cleaning machine with squeegee assembly. 4,429,433, Cl. 15-320.000.

Burkhardt, Joseph A.; Childers, Thomas W.; Hanson, Harry R.; and Harkrider, Bobby M., to Exxon Production Research Co. Hydraulically operated actuator. 4,429,620, Cl. 91-395.000.

Burley, Harvey A., to General Motors Corporation. Valved prechamber diesel engine and method of operating. 4,429,669, Cl. 123-179.00H.

Burnett, Edward L.; and Stack, Eugene V., to Dow Chemical Company, The. Method for the extrusion of tetrafluoroethylene polymer tubes. 4,430,283, Cl. 264-127.000.

Burnham, Francis L., to Orangeburg Technologies, Inc. Multiple-stage pump compressor. 4,429,540, Cl. 62-188.000.

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Bryant, David M.; Corbeil, Ryn C.; Malcolm, Michael A.; Rogers, Lawrence D.; and Thompson, Donald R., 4,430,651, Cl. 340-825.520.
Catiller, Robert D.; Harris, Craig W.; and Mathews, Ronald D., 4,430,710, Cl. 364-200.000.
Catiller, Robert D., 4,430,735, Cl. 371-25.000.
Isaman, David L., 4,430,708, Cl. 364-200.000.
Kim, Dongsung R., 4,430,707, Cl. 364-200.000.
Sand, Duane B., 4,430,706, Cl. 364-200.000.

Burroughs Wellcome Co.: *See*—
Patzke, James V.; and Rosenberg, Burton J., 4,430,435, Cl. 436-504.000.

Burrus, Brice M. Roundness calibration standard. 4,429,464, Cl. 33-174.00Q.

Burton, R. Edward. Burning system and method. 4,429,645, Cl. 110-346.000.

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Butterfield, Ida M., to Butterfield Group. Broken seal detector. 4,429,803, Cl. 215-366.000.

Butterfield, Roger P., to Emerson Electric Co. Motion transmitting device. 4,429,595, Cl. 74-804.000.

Buttner, Robert C., to Concrete Pipe & Products Corp. Flexible pipe gasket. 4,429,886, Cl. 277-207.00A.

Butz, Hans, to Fichtel & Sachs AG. Mounting device for a bicycle hub. 4,429,448, Cl. 29-281.500.

Buysch, Hans-Josef; Illger, Hans-Walter; and Dorner, Karl H., to Bayer Aktiengesellschaft. Stabilizer-containing reactive components for PU-foams, new stabilizers and a process for producing these stabilizers. 4,430,452, Cl. 521-107.000.

Buzzelli, Dennis K.: *See*—
Irons, Gary C.; Buzzelli, Dennis K.; Klein, John F.; and Smyth, Richard T., 4,430,546, Cl. 219-121.0PY.

Byk Gulden Lomberg Chemische Fabrik Gesellschaft mit beschrankter Haftung: *See*—
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Byrd, Carlisle O., Jr.: *See*—
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Byrd, James D.; and Highiower, James O., to Thiokol Corporation. Adhesive liner for case bonded solid propellant. 4,429,634, Cl. 102-290.000.

C. Otto & Comp. G.m.b.H.: *See*—
Ernst, Friedrich, 4,429,908, Cl. 292-35.000.

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Cabot Corporation: *See*—
Crook, Paul, 4,430,297, Cl. 420-442.000.

Caillebotte, Alain M.: *See*—
Gentet, Pierre; Geoffroy, Alain Y.; and Caillebotte, Alain M., 4,430,715, Cl. 364-426.000.

Caldwell, Donald L., to Dow Chemical Company, The. Catalytic decomposition of hypochlorite using substituted cobalt oxide spinels. 4,430,315, Cl. 423-499.000.

Calgon Corporation: *See*—
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California Strolee, Inc.: *See*—
Hyde, Richard E.; Smith, Gary L.; Carmichael, Lee T.; and Meader, Albert E., 4,429,916, Cl. 297-250.000.

Callaghan, Vincent M.; Flynn, Edward P.; and Pokora, Bohdan M., to Combustion Engineering, Inc. Containment hydrogen removal system for a nuclear power plant. 4,430,293, Cl. 376-314.000.

Calvert, John H., to Hocking Electronics Limited. Reflection type probes for eddy current testing instruments. 4,430,615, Cl. 324-239.000.

Cam Gears Limited: *See*—
Adams, Frederick J., 4,429,621, Cl. 91-420.000.

Campbell, David L.: *See*—
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Campbell, Simon F.; Cross, Peter E.; and Stubbs, John K., to Pfizer Inc. Dihydropyridine anti-ischaemic and antihypertensive agents. 4,430,333, Cl. 424-266.000.

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Tremblay, Meude, 4,430,131, Cl. 149-19.400.

Canfield, V. Robert: *See*—
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Cannavino, James A.; Heller, Andrew R.; Taradalsky, Morris; and Worley, William S., Jr., to International Business Machines Corp. Authorization mechanism for establishing addressability to information in another address space. 4,430,705, Cl. 364-200.000.

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Patterson, Thomas C.; and Campbell, David L., 4,429,818, Cl. 224-39.000.

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Hosoe, Kazuya; Kinoshita, Takao; and Yamamichi, Masayoshi, 4,429,966, Cl. 354-406.000.
Matsumoto, Toru; and Takenouchi, Masanori, 4,430,409, Cl. 430-106.600.
Nakatsui, Hisashi; and Hajimoto, Yoshioki, 4,430,666, Cl. 358-44.000.
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Suzuki, Nobuyuki, 4,429,974, Cl. 354-484.000.
Taka, Hideo; and Masunaga, Makoto, 4,429,968, Cl. 354-403.000.
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Capachi, Nickolas E. Foul or base lines for athletic activities. 4,429,872, Cl. 273-25.000.

Cardiovascular Diagnostic Services, Inc.: *See*—
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Cardo, Philip T. Side stream separation system for mechanical collectors and method of constructing same. 4,430,100, Cl. 55-344.000.

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Knoke, Jurgen; Buchwald, Holger; and Fehlhaber, Jurgen, 4,430,372, Cl. 428-90.000.

Carl-Zeiss-Stiftung: *See*—
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Carlier, Patrick; Monteil, Andre J. C.; and Simond, Jacques A. L., to Centre Europeen de Recherches Mauvernay. Ethers of 1-(2-propynyloxy)-2-amino-3-propanol. 4,430,332, Cl. 424-248.570.

Carlingswitch, Inc.: *See*—
Sorenson, Richard W., 4,430,534, Cl. 200-68.300.

Carlisle, Richard S. Method and apparatus for sealing and cutting plastic films. 4,430,069, Cl. 493-203.000.

Carlsen, Russell O.: *See*—
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Carlson, Richard K., to MPC Products Corporation. Coaxial coupling and locking mechanism. 4,430,632, Cl. 336-120.000.

Carmichael, Lee T.: *See*—
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Carrier Corporation: *See*—
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McManus, John R.; and Jackson, Dale, 4,429,737, Cl. 165-125.000.
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Carruthers, George A. Traction force adjustment apparatus. 4,429,692, Cl. 128-75.000.

Carsac, Claude R.: *See*—
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Carson/Burger/Weekly, Inc.: *See*—
Carson, David E.; and Dalke, George W., 4,429,998, Cl. 356-428.000.

Carson, David E.; and Dalke, George W., to Carson/Burger/Weekly, Inc. Apparatus for the detection of faults in cups, glasses or the like. 4,429,998, Cl. 356-428.000.

Carson, Kent R.: *See*—
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Carstab Corporation: *See*—
Dalter, Raymond S.; and Gilmore, Dennis W., 4,430,127, Cl. 106-273.00N.

Carter, William A., to Inland Steel Company. Method and apparatus for electro-treating a metal strip. 4,430,166, Cl. 204-15.000.

Cartier, Jacques, to Radiall. Connector for optical fibers wherein individual fiber is centered by a plurality of balls. 4,429,949, Cl. 350-96.210.

Case, Cecil L.: *See*—
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Cash, Dennis R., to Chevron Research Company. Hydrotreating or hydrocracking process. 4,430,203, Cl. 208-210.000.

Casper, Clemens; Grenner, Dieter; Klette, Gerd-Rudiger; and Tholema, Edzard, to Bayer Aktiengesellschaft. Process for drying pumpable suspensions. 4,430,156, Cl. 159-47.100.

Casper, Clemens: *See*—
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Cassella Aktiengesellschaft: *See*—
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Honel, Hans; Michel, Walter; Piesch, Steffen; Schluter, Karin; Seidel, Manfred; and Spieler, Wolfgang, 4,430,380, Cl. 428-254.000.
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Castagnos, Leonce F., Jr.; and Pratt, Roy E., to Texaco, Inc. Regeneration of fluidizable catalyst. 4,430,201, Cl. 208-164.000.

Castrantas, Harry M.; and Berkowitz, Sidney, to FMC Corporation. Polymeric foam derived from polymaleic anhydride and its preparation. 4,430,454, Cl. 521-107.000.

Castro-Hahn, Victor, to Xerox Corporation. Moving nip constant velocity document transport. 4,429,866, Cl. 271-266.000.

Cathay Pen Corporation: *See*—
Tsai, Kuo L., 4,430,014, Cl. 401-216.000.

Cathey, W. Thomas: *See*—
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Catiller, Robert D.; Harris, Craig W.; and Mathews, Ronald D., to Burroughs Corporation. Subsystem controller. 4,430,710, Cl. 364-200.000.

Catiller, Robert D., to Burroughs Corporation. Apparatus and technique for testing IC memories. 4,430,735, Cl. 371-25.000.

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Celotex Corporation: *See*—
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Merck, James Q.; and Barry, Leon F., 4,430,209, Cl. 209-3.000.

CEM Compagnie Electro-Mecanique: *See*—
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Centre Europeen de Recherches Mauvernay: *See*—
Carlier, Patrick; Monteil, Andre J. C.; and Simond, Jacques A. L., 4,430,332, Cl. 424-248.570.

Cesati, Mario. Horn loudspeakers of the sectorial diffusion type, and method for making said loudspeakers. 4,429,762, Cl. 181-159.000.
Chace, David M.: *See*—
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Chadima, George E., Jr.; and Kubler, Joseph J., to Norand Corporation. System and method for communication between nodes of a closed loop local communication path. 4,430,700, Cl. 364-200.000.
Chaffiotte, Pierre; and Guicherd, Christian, to Regie Nationale des Usines Renault. Disconnecting valve rocker mechanism. 4,429,853, Cl. 123-198.00F.
Challenge-Cook Brothers, Inc.: *See*—
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Challenge Machinery Company, The: *See*—
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Kaleja, Juris P.; Chalmers, Bruce; and Surek, Thomas, 4,430,305, Cl. 422-246.000.
Chance, Dudley A.; Ho, Chung W.; and Reiley, Timothy C., to International Business Machines Corporation. Low inductance MLC capacitor with metal impregnation and solder bar contact. 4,430,690, Cl. 361-321.000.
Chang, Jack P.; and Steinbrecher, Marc L., to International Business Machines Corporation. Early fuser roll closure with reduced force. 4,429,987, Cl. 355-14.0FU.
Chang, Wen-Hsuan; Piccirilli, Robert; and Kasper, Walter F., to PPG Industries, Inc. Film-forming urethane resins containing alkoxy silane groups and acrylyl groups. 4,430,486, Cl. 525-44.000.
Chapman, Eugene K., to Amca International Corporation. Thread forming fastener. 4,430,036, Cl. 411-416.000.
Chapman, William A., Jr.; and Crowley, John J., to Westvaco Corporation. Rotary envelope cutting method. 4,429,603, Cl. 83-37.000.
Chatelain, Jean-Claude: *See*—
Weichlein, Bernard; Chatelain, Jean-Claude; and Gaihier, Denis, 4,429,706, Cl. 137-66.000.
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Chawla, Jai H.; and Colasanti, Arduino, to Allied Corporation. Winding spring especially for seat belt retractor. 4,429,840, Cl. 242-107.000.
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Chemplex Company: *See*—
Schmukler, Seymour; Machonis, John, Jr.; and Shida, Mitsuzo, 4,430,135, Cl. 156-244.110.
Chen, Richard M.; and Feldman, Marvin. Golf game simulator device. 4,429,880, Cl. 273-176.0FA.
Cheung, William S. H., to Payview Limited. Transmitting and receiving apparatus for permitting the transmission and reception of multitier subscription programs. 4,430,669, Cl. 358-122.000.
Chevron Research Company: *See*—
Cash, Dennis R., 4,430,203, Cl. 208-210.000.
Chi, John W. H., to United States of America, Energy. Packed fluidized bed blanket for fusion reactor. 4,430,291, Cl. 376-146.000.
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Chiba, Ko; Yamauchi, Hajime; Kawauchi, Yoneo; and Ikeda, Yukio, to Kabushiki Kaisha Riken. Spacer and expander member for holding and biasing piston ring rails. 4,429,885, Cl. 277-140.000.
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Chisso Corporation: *See*—
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Cho, Moo J., to Upjohn Company, The. Stabilization of PGI_2 compounds with surfactants. 4,430,340, Cl. 424-285.000.
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Brode, George L.; Chow, Sui-Wu; and Hale, Warren F., 4,430,473, Cl. 524-492.000.
Christensen, Dean L.; and Ebey, Frank S., to Memorex Corporation. Latch and handle assembly for magnetic recording disc cartridge. 4,429,790, Cl. 206-444.000.
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Kornerup, Klaus; and Christensen, Per B., 4,429,494, Cl. 49-386.000.
Christian, John H.; Hartung, Michael H.; Nolta, Arthur H.; Reed, David G.; Rieck, Richard E.; Tayler, Gerald E.; and Williams, John S., to International Business Machines Corporation. Method and apparatus for a hierarchical paging storage system. 4,430,701, Cl. 364-200.000.
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Chu, Nan S.; and Marlin, Lawrence, to Union Carbide Corporation. Polymeric antioxidants. 4,430,235, Cl. 252-49.600.
Chugai Denki: *See*—
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Chugai Seiyaku Kabushiki Kaisha: *See*—
Watanabe, Mitsuo; Kimura, Shigeyuki; Konishi, Hideki; Tsuji, Yasuhiro; and Wakabayashi, Kiyoshige, 4,429,583, Cl. 73-864.120.
Ciavatta, Armand. Oblate friction rock stabilizer and installation lubricating cement utilized therewith. 4,430,025, Cl. 405-261.000.
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Leppard, David G., 4,430,425, Cl. 430-551.000.
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Heusler, Karl; Bickel, Hans; Fechtig, Bruno; Peter, Heinrich; and Scartazzini, Riccardo, 4,430,498, Cl. 544-16.000.
Schafer, Paul; Abel, Heinz; and Mayer, Fritz, 4,430,261, Cl. 260-404.800.
Cillario, Lorenzo, to Ferrero S.p.A. Confectionary product with a filling. 4,430,351, Cl. 426-103.000.
Cirrito, Anthony J., to CTP Partners. Method and apparatus for total energy systems. 4,430,046, Cl. 417-55.000.
Cise Centro Informazioni Studi Esperienze SpA: *See*—
Angelino-Pievani, Giancarlo, 4,429,690, Cl. 128-92.00D.
Cities Service Company: *See*—
Dobreski, David V., 4,430,457, Cl. 523-100.000.
Citizen Watch Co., Ltd.: *See*—
Matsumoto, Masataka, 4,430,532, Cl. 200-52.00R.
Nishikubo, Yasuhiko, 4,430,008, Cl. 368-202.000.
Togashi, Seigo; and Tsuzuki, Akira, 4,430,648, Cl. 340-718.000.
Claassen, George R.; and Ewing, John J., to PPG Industries, Inc. Method and apparatus to remove sharply bent, tempered glass sheets from a cooling station. 4,430,111, Cl. 65-114.000.
Claassen, George R.: *See*—
Frank, Robert G.; Claassen, George R.; Ewing, John J.; and Fecik, Michael T., 4,430,110, Cl. 65-104.000.
Claber S.p.A.: *See*—
Spadotto, Oliviano; Roman, Gianfranco; and Da Rold, Claudio, 4,429,906, Cl. 285-315.000.
Claes, Andre K.: *See*—
Van de Sande, Christian C.; Vandewalle, Jan J.; Van Poucke, Raphael K.; and Claes, Andre K., 4,430,421, Cl. 430-377.000.
Clarion Co., Ltd.: *See*—
Yamaguchi, Katsumi; and Okada, Hitoshi, 4,430,680, Cl. 360-137.000.
Clark Equipment Company: *See*—
Haddock, Louis A., Jr.; and Jones, Ronald L., 4,429,761, Cl. 180-271.000.
Clark, James M.; and Secrist, Duane R., to Great Lakes Carbon Corporation. Method of manufacturing aluminum in a Hall-Heroult cell. 4,430,189, Cl. 204-290.00R.
Clark, Ray, to Applied Power Inc. Latch mechanism. 4,429,759, Cl. 180-89.140.
Clayton, Richard M.; and Johnson, Arthur ., to Savage Rite-Way Corporation. Front-discharge nitrate truck. 4,430,028, Cl. 406-39.000.
Clement, Anton, to August Thiele. Scraper blade assembly for central chain scraper conveyors. 4,429,783, Cl. 198-731.000.
Clements, Alwin S.: *See*—
Brock, Alan J.; Clements. Alwin S.; and Horrocks, Brian J., 4,430,686, Cl. 361-229.000.
Clements, Herbert A.; and Heybourne, Robert H., to S. S. S. Patents Limited. Pawl and ratchet mechanism. 4,429,774, Cl. 192-53.00H.
Clery, Howard K., Jr.; and Pennimaa, Scott R., to Rep Industries Inc. Posting board. 4,429,901, Cl. 282-29.00B.
Clopay Corporation: *See*—
Winslow, Randy, 4,429,729, Cl. 160-315.000.
Coca-Cola Company, The: *See*—
Malone, Michael J.; and Miles, Evelyn A., 4,430,349, Cl. 426-34.000.
Cochran, Larry A., to RCA Corporation. Automatic video signal peaking and color control. 4,430,665, Cl. 358-37.000.
Cohn, Johann G. E., to Engelhard Corporation. Electrodes for use in an electrolytic process. 4,430,188, Cl. 204-290.00F.
Colasanti, Arduino: *See*—
Chawla, Jai H.; and Colasanti, Arduino, 4,429,840, Cl. 242-107.000.
Colgate-Palmolive Company: *See*—
Broze, Guy; and Laitem, Leopold, 4,430,244, Cl. 252-94.000.
Gaffar, Abdul; and Davis, Calvin B., 4,430,325, Cl. 424-128.000.
Karami, Hamzeh, 4,430,088, Cl. 604-385.000.
Pierce, Robert C.; and Bala, Frank J., Jr., 4,430,237, Cl. 252-173.000.
Collin, Gerd: *See*—
Kreysa, Gerhard; and Collin, Gerd, 4,430,175, Cl. 204-72.000.
Collins, Wesley A. Tie caddy. 4,429,797, Cl. 211-119.000.
Combustion Engineering, Inc.: *See*—
Callaghan, Vincent M.; Flynn, Edward P.; and Pokora, Bohdan M., 4,430,293, Cl. 376-314.000.
Deve, Vagn, 4,429,642, Cl. 110-236.000.
Sullivan, Robert P., 4,429,640, Cl. 110-165.00R.
Cominco Ltd.: *See*—
Anderson, Harold J. T.; Kerby, Robert C.; Krauss, Clifford J.; and Neame, Hubert W., 4,430,178, Cl. 204-114.000.

Commers, Louis P., to Suburban Duplicator Repair, Inc. Auxiliary inking roller kit for duplicating press. 4,429,631, Cl. 101-349.000.

Commissariat a l'Energie Atomique: *See*—
Bouquet, Gerard, 4,430,577, Cl. 307-108.000.

Compagnie Francaise des Petroles: *See*—
de Sivry, Bruno J. M.; Carsac, Claude R.; and Bonnet, Christian, 4,430,550, Cl. 219-121.0ED.

Composite Container Corporation: *See*—
Bonis, Laszlo J., 4,430,288, Cl. 264-510.000.

Comstock, Wayne P.: *See*—
Barber, Jerry L., 4,429,867, Cl. 272-32.000.

Concrete Pipe & Products Corp.: *See*—
Buttner, Robert C., 4,429,886, Cl. 277-207.00A.

Conmaco, Inc.: *See*—
Jackson, E. Don; and Myers, Ralph E., 4,429,751, Cl. 173-13.000.

Conoco Inc.: *See*—
Coon, Julian B.; and Schafers, Charles J., 4,430,653, Cl. 343-5.0NA.
Goodstine, Stephen L.; and Jukkola, Glen D., 4,429,471, Cl. 34-10.000.
Poynor, Paul C.; and Romine, Hugh E., 4,430,197, Cl. 208-56.000.
Reichl, Eric H., 4,430,444, Cl. 518-703.000.

Conrad, Richard A. Control valve. 4,429,716, Cl. 137-625.350.

Consolidated Devices, Inc.: *See*—
Grabovac, Bosko; and Vuceta, Ivan N., 4,429,597, Cl. 81-57.390.

Container Corporation of America: *See*—
Kipp, Michael A., 4,429,825, Cl. 229-1.50B.
Wolff, Natalie A., 4,429,420, Cl. 2-175.000.

Control Data Corporation: *See*—
Schiebe, Lowell H.; Russo, Bruce E.; Urness, Edward V.; and Hohn, William C., 4,430,702, Cl. 364-200.000.
Smith, Donald O.; and Harte, Kenneth J., 4,430,571, Cl. 250-492.200.

Cook, Evin L., to Mobil Oil Corporation. Oil recovery method. 4,429,744, Cl. 166-263.000.

Cook, Evin L., to Mobil Oil Corporation. Oil recovery method. 4,429,745, Cl. 166-263.000.

Cook, Gary R.: *See*—
Beitel, James E.; Bruce, Charles R.; Cook, Gary R.; Mosier, Charles F., Jr.; and Sartore, Edward L., 4,430,728, Cl. 364-900.000.

Cook, Inc.: *See*—
Timmermans, Hans A., 4,430,081, Cl. 604-256.000.

Cook, Marvin C.: *See*—
Bedenbender, John W.; Cook, Marvin C.; and Johnston, Otis A., 4,429,898, Cl. 280-678.000.

Coon, Julian B.; and Schafers, Charles J., to Conoco Inc. Earth probing radar system. 4,430,653, Cl. 343-5.0NA.

Cooper, Robin D. G., to Eli Lilly and Company. Allylic chlorination process. 4,430,268, Cl. 260-239.00A.

Cooper, William T., to Phillips Petroleum Company. Benzothiazyl sulfenamides as scorch retardants for mercaptosilane-coupled silica filled-rubber compounds. 4,430,466, Cl. 524-83.000.

Copal Company Limited: *See*—
Okabe, Katsuhiko, 4,429,988, Cl. 355-28.000.

Copeland, William M.; Blomgren, Roland A.; and Shallenberg, Robert L., to ServiceMaster Industries, Inc. Sanitizer attachment for a mobile floor cleaner. 4,429,432, Cl. 15-320.000.

Coppock, C. Wallace. Game of chance to be played in conjunction with a baseball game. 4,429,877, Cl. 273-139.000.

Corbeil, Ryn C.: *See*—
Bryant, David M.; Corbeil, Ryn C.; Malcolm, Michael A.; Rogers, Lawrence D.; and Thompson, Donald R., 4,430,651, Cl. 340-825.520.

Cormier, Leo P. Method and apparatus for clearing earth drill cuttings from around drill holes. 4,429,754, Cl. 175-88.000.

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Schnur, Friedrich; Cornils, Boy; Hibbel, Josef; and Lieder, Bernhard, 4,430,096, Cl. 48-206.000.

Corning Glass Works: *See*—
Palmquist, Ronald W., 4,430,109, Cl. 65-32.000.

Cortellino, Charles A.; Levine, Joseph E.; and Schick, Henry C., to International Business Machines Corporation. Developing apparatus for exposed photoresist coated wafers. 4,429,983, Cl. 354-320.000.

Coulson, Richard L.; Blickenstaff, Ronald L.; Dodd, P. David; Moreno, Robert J.; and Kinard, Dean P., to Storage Technology Corporation. Adaptive domain partitioning of cache memory space. 4,430,712, Cl. 364-300.000.

Coulter Electronics, Inc.: *See*—
Horne, Thomas, 4,430,299, Cl. 422-64.000.

Cowan, William S., to Armco Inc. Remotely releasable connector. 4,429,902, Cl. 285-3.000.

Crawford, George H.; Downing, Edward J.; and Schlemmer, Roy G., to Minnesota Mining and Manufacturing Company. Metal/metal oxide coating. 4,430,366, Cl. 427-162.000.

Cresap, Wesley L., to Bell Helicopter Textron, Inc. Helicopter power train for distributing rotor blade flapping displacements through a plurality of drive train components. 4,430,045, Cl. 416-138.000.

Cresswell, James L.: *See*—
Harvey, Susan L.; Cresswell, James L.; and Huff, B. Jerry L., 4,430,381, Cl. 428-284.000.

Creusot-Loire-Vallourec: *See*—
Mola, Michel, 4,430,388, Cl. 428-595.000.

Cromeens, Jeff Y., to Industrial Woodworking Machine. Infeed assembly for random length and shaping machine. 4,429,784, Cl. 198-744.000.

Crook, Paul, to Cabot Corporation. Hard nickel-base alloy resistant to wear and corrosion. 4,430,297, Cl. 420-442.000.

Cross, Peter E.: *See*—
Campbell, Simon F.; Cross, Peter E.; and Stubbs, John K., 4,430,333, Cl. 424-266.000.

Crowley, John J.: *See*—
Chapman, William A., Jr.; and Crowley, John J., 4,429,603, Cl. 83-37.000.

Csapo, Michael A.: *See*—
Hoover, Donald P.; Csapo, Michael A.; and Siemssen, Ernst A., 4,430,057, Cl. 432-154.000.

Csongrad Megyei Tanacsi Epitoipari Vallalat: *See*—
Czenthe, Zoltan, 4,429,507, Cl. 52-650.000.

Csorba, Istvan: *See*—
Vajdovich, Gyorgy; and Csorba, Istvan, 4,430,512, Cl. 210-745.000.

Csoszereloipari Vallalat: *See*—
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Cirrito, Anthony J., 4,430,046, Cl. 417-55.000.

CTS Corporation: *See*—
Hufford, James N.; and Zdanys, John, Jr., 4,430,634, Cl. 338-164.000.

Cucuiat, Iuliu M.; Holdis, Gabriel; and Hanciulescu, Valentin E., to Institutul de Cercetari si Proiectari Pentru Petrol si Gaze. Method and apparatus for the determination of the density of light hydrocarbons mixtures. 4,429,572, Cl. 73-433.000.

Culbertson, Billy M.; and Tufts, Timothy A., to Ashland Oil, Inc. Poly(ether-amide) polymeric compositions. 4,430,491, Cl. 528-153.000.

Cushman, Richard, to Noster Industries, Inc. Rotary pull down pull up drive for drill pipes. 4,429,753, Cl. 173-149.000.

Czechowski, Joseph, III: *See*—
Darrel, Bernard; and Czechowski, Joseph, III, 4,429,578, Cl. 73-659.000.

Czenthe, Zoltan, to Csongrad Megyei Tanasci Epitoipari Vallalat. Universal building frame. 4,429,507, Cl. 52-650.000.

Dahowski, Donald E.: *See*—
Weir, Donald H.; and Dahowski, Donald E., 4,429,425, Cl. 4-503.000.

Daimler-Benz Aktiengesellschaft: *See*—
Lubbing, Bernd-Eric, 4,429,674, Cl. 123-531.000.

Dainippon Ink & Chemicals Inc.: *See*—
Hayakawa, Eizi; Kojima, Akio; Arai, Yoshi; Sakuma, Masatoshi; and Toyoshima, Yukichi, 4,430,379, Cl. 428-216.000.

D'Alessio, Michael S., to Harsco Corporation. Connector assembly. 4,430,019, Cl. 403-409.000.

Dalke, George W.: *See*—
Carson, David E.; and Dalke, George W., 4,429,998, Cl. 356-428.000.

Dalter, Raymond S.; and Gilmore, Dennis W., to Carstab Corporation. Epoxylated amine asphalt anti-stripping agent. 4,430,127, Cl. 106-273.00N.

D'Altroy, Frederick A.; and Lindner, Richard, to Bell Telephone Laboratories, Incorporated. Prevention of surface channels in silicon semiconductor devices. 4,430,663, Cl. 357-53.000.

Damar Manufacturing Company: *See*—
Martin, Otto H. J., 4,430,211, Cl. 209-314.000.

Dango, Manfred. Curve-negotiating plate conveyor. 4,429,785, Cl. 198-852.000.

Daniels, Michael P.; and Schoonover, Robert J., to Minnesota Mining and Manufacturing Company. Process of making information carrying systems. 4,430,363, Cl. 427-54.100.

Dankert, Harry S.: *See*—
Beyer, William F.; Dankert, Harry S.; and English, James C., 4,429,584, Cl. 73-864.210.

Dapco Industries, Inc.: *See*—
Norris, James R., 4,429,576, Cl. 73-636.000.

Daroczy, Janos; Erdelyi, Janos; Havas, Jeno; Kecskes, Lajos; and Muller, Henrik, to Radelkis Elektrokemiai Muszergyarto Szovetkezet. Fault-compensating electro-analytical measuring process and equipment. 4,430,164, Cl. 204-1.00T.

Da Rold, Claudio: *See*—
Spadotto, Oliviano; Roman, Gianfranco; and Da Rold, Claudio, 4,429,906, Cl. 285-315.000.

Darrel, Bernard; and Czechowski, Joseph, III, to General Electric Company. Acoustical defect detection system. 4,429,578, Cl. 73-659.000.

Davidson, Greg J.: *See*—
Davis, Stuart M.; and Davidson, Greg J., 4,430,395, Cl. 429-158.000.

Davies, Guy E.: *See*—
Matthews, Robert B.; and Davies, Guy E., 4,429,528, Cl. 60-39.281.

Davies, Mervyn W.: *See*—
Spenceley, Gene D.; Davies, Mervyn W.; and Robson, Alan L., 4,430,117, Cl. 75-51.000.

Davis, Calvin B.: *See*—
Gaffar, Abdul; and Davis, Calvin B., 4,430,325, Cl. 424-128.000.

Davis, Marvin A., to Owatonna Tool Company. Bearing cup installing tool. 4,429,447, Cl. 29-275.000.

Davis, Raymond W., to Plibrico (Canada) Limited. Interlocking refractory segments. 4,429,721, Cl. 138-149.000.

Davis, Robert D., Jr.; and Schucker, James S. Self propelled lawn mower. 4,429,515, Cl. 56-6.000.

Davis, Stuart M.; and Davidson, Greg J., to Rayovac Corporation. Cell with overflow spout. 4,430,395, Cl. 429-158.000.

Davis, William L., to MSL Industries, Inc. Electric motor with unitary rotor housing. 4,430,590, Cl. 310-67.00R.

Davison, John B., to Occidental Chemical Corporation. Electrolytic process for producing hydrogen peroxide. 4,430,176, Cl. 204-84.000.

Davy-Loewy Limited: *See*—
Hemingway, Trevor; and Middleton, Anthony E., 4,430,041, Cl. 414-787.000.

Davy McKee Aktiengesellschaft: *See*—
Albers, Manfred; Keunecke, Gerhard; and Krimphove, Herbert, 4,430,163, Cl. 203-75.000.

Day, William J., Jr., to Raytheon Company. Combination microwave gas convection oven. 4,430,541, Cl. 219-10.55R.

Dayco Corporation: *See*—
Hill, James D., Jr; Alexander, David L.; and Brooks, Thomas W., 4,429,465, Cl. 33-174.00E.

dbx, Inc.: *See*—
Adams, Robert W., 4,430,626, Cl. 331-108.00B.

Dear, Terrence A.: *See*—
Hughes, Allan B.; and Dear, Terrence A., 4,429,714, Cl. 137-625.300.

Deaton, David W., to American Hospital Supply Corp. Method for pre-use storage of a medical receptacle. 4,430,084, Cl. 604-317.000.

de Brabant, Jean Y. Atrium building structure. 4,429,501, Cl. 52-236.200.

de Cremoux, Baudouin: *See*—
Nuyen, Trong L.; and de Cremoux, Baudouin, 4,430,740, Cl. 372-45.000.

Deere & Company: *See*—
Michael, Richard A., 4,429,593, Cl. 74-687.000.

Deering, Dana F.; and Stein, Edward I., to General Electric Company. Method of removing volatiles in the preparation of silicone compositions. 4,430,461, Cl. 523-340.000.

De Freitas, Elias M., to Termolar S/A. Mechanical device to transfer liquids from containers. 4,429,813, Cl. 222-207.000.

Degussa Aktiengesellschaft: *See*—
Bethge, Horst; Drauz, Karlheinz; Kleemann, Axel; Martens, Jurgen; and Weigel, Horst, 4,430,509, Cl. 562-401.000.
Kreher, Alfons; Kuhner, Gerhard; Rothbuhr, Lothar; Turk, Gunter; and Wolff, Siegfried, 4,430,280, Cl. 264-117.000.

Dehnert, Johannes, to BASF Aktiengesellschaft. Metal complex dyes derived from 4-phenylazo-5-aminopyrazoles. 4,430,267, Cl. 260-147.000.

Deis, Daniel W.; McNab, Ian R.; and Smith, Joseph L., Jr., to Westinghouse Electric Corp. Electromagnetic projectile launcher with an automatic plasma formation device. 4,429,613, Cl. 89-8.000.

DeJager, Thomas M. Mobile home stabilizer. 4,429,851, Cl. 248-354.00S.

Delassus, Jean, to CEM Compagnie Electro-Mecanique. Translating field inductor for producing a directionally oriented flux within the stirring roller of a continuous caster for slabs. 4,429,731, Cl. 164-504.000.

de Macedo, Pedro B.: *See*—
Hojaji, Hamid; de Macedo, Pedro B.; and Litovitz, Theodore A., 4,430,108, Cl. 65-22.000.

de Macedo, Pedro Buarque: *See*—
Hojaji, Hamid; de Macedo, Pedro B.; and Litovitz, Theodore A., 4,430,108, Cl. 65-22.000.

de Miguel Lopez, Isidoro: *See*—
Gazapo Santa-Olalla, Jose L.; Gonzalez Feliu, Juan; and de Miguel Lopez, Isidoro, 4,430,168, Cl. 204-35.00N.

Denki Kagaku Kogyo Kabushiki Kaisha: *See*—
Nakajima, Takashi; and Matsui, Fujio, 4,430,518, Cl. 136-234.000.

Dennert, Hans V.: *See*—
Dennert, Heinz; Denaert, Hans V.; and Seidl, Alois, 4,430,107, Cl. 65-22.000.

Dennert, Heinz; Dennert, Hans V.; and Seidl, Alois, to Dennert, Heinz. Method for making shaped foam glass bodies. 4,430,107, Cl. 65-22.000.

Dennison Manufacturing Company: *See*—
Paradis, Joseph R., 4,429,437, Cl. 24-150.0FP.

dePuglia, Gaston D.; and Huber, Greg A. Strip processing apparatus. 4,429,559, Cl. 72-186.000.

Der, Chuck F.: *See*—
Steinbruegge, Harold A.; and Der, Chuck F., 4,430,697, Cl. 363-49.000.

de Sivry, Bruno J. M.; Carsac, Claude R.; and Bonnet, Christian, to Compagnie Francaise des Petroles. Electron beam welding. 4,430,550, Cl. 219-121.0ED.

DesMarais, Raymond C., Jr., to Additive Technology Corporation. Method, materials and apparatus for manufacturing printed circuits. 4,429,657, Cl. 118-114.000.

Deutsche Babcock Anlagen Aktiengesellschaft: *See*—
Thomas, Lothar, 4,429,644, Cl. 110-245.000.

Deve, Vagn, to Combustion Engineering, Inc. Thermal reclaimer apparatus for a thermal sand reclamation system. 4,429,642, Cl. 110-236.000.

DeZubay, Egon A.: *See*—
Spurrier, Francis R.; DeZubay, Egon A.; Murray, Alexander P.; and Vidt, Edward J., 4,430,304, Cl. 422-204.000.

Dhein, Rolf: *See*—
Reuter, Knud; and Dhein, Rolf, 4,430,504, Cl. 556-482.000.
Schreckenberg, Manfred; Burgdorfer, Hans-Heribert; Dhein, Rolf; and Schneider, Gottfried, 4,430,492, Cl. 528-176.000.

Diamond Shamrock Corporation: *See*—
Bennett, John E.; and Harney, David E., 4,430,393, Cl. 429-101.000.

Dibernardi, Peter A. Pipe support system. 4,429,497, Cl. 52-27.000.

Dickson, Dale A.: *See*—
Sorenson, Paul D.; and Dickson, Dale A., 4,429,577, Cl. 73-644.000.

Diehl, Robert E.: *See*—
Lutz, Albert W.; and Diehl, Robert E., 4,430,114, Cl. 71-105.000.

Diesel Kiki Co., Ltd.: *See*—
Hara, Toshizo; Sutoh, Shinji; and Kojima, Toshio, 4,429,733, Cl. 165-16.000.

Diffrient, Niels, to Hauserman Inc. Int. Furniture & Textile Division. Chair. 4,429,917, Cl. 297-300.000.

DiGiulio, Adolph V., to Atlantic Richfield Company. Fast-cool vinyl aromatic expandable polymers. 4,430,449, Cl. 521-56.000.

Dijkmans, Eise C.: *See*—
Van Kessel, Theodorus J.; Dijkmans, Eise C.; and Van Uden, Albertus J. P. M., 4,430,609, Cl. 323-350.000.

Dillow, Harry M.; Sansone, Anthony E.; and Swartz, Raymond K., to Western Electric Company, Inc. Compositely insulated conductor having a layer of irradiation cross-linked polymeric plastic material. 4,430,385, Cl. 428-380.000.

Dines, David R.: *See*—
Broyer, Alfred P.; and Dines, David R., 4,429,454, Cl. 29-747.000.

Dinger, Hans, to MTU-Motoren- und Turbinen-Union Friedrichshafen GmbH. Supercharged internal combustion engine with two controllable exhaust gas turbochargers. 4,429,533, Cl. 60-606.000.

Dirkes, James V., to Rapid Engineering, Inc. Modulair air heater. 4,429,679, Cl. 126-110.00A.

Discovision Associates: *See*—
Wilkinson, Richard L., 4,430,401, Cl. 430-8.000.

Ditcher Saw Company: *See*—
Tice, Bernard O.; and Bailey, Gene E., 4,429,477, Cl. 37-80.00R.

Diversified Eastern, Inc.: *See*—
Pegon, Alexander A., Jr., 4,429,512, Cl. 53-534.000.

Dixon International Limited: *See*—
Reeve, William E., 4,429,450, Cl. 29-451.000.

Dlugos, Daniel F.; and Manduley, Flavio M., to Pitney Bowes Inc. Postage value determining scale with expandable memory port. 4,430,716, Cl. 364-466.000.

Doak, Ron K. Repairing a roller chain. 4,429,525, Cl. 59-7.000.

Dobreski, David V., to Cities Service Company. Cling/stretch wrap compositions. 4,430,457, Cl. 523-100.000.

Docherty, Andrew J. P.: *See*—
Sanders, Johan P. M.; and Docherty, Andrew J. P., 4,430,434, Cl. 435-253.000.

Dr. Ing.h.c.F. Porsche AG: *See*—
Bez, Ulrich; Schroder, Gerhard; and Rauser, Richael, 4,429,914, Cl. 296-188.000.

Dr. Karl Thomae Gesellschaft mit beschrankter Haftung: *See*—
Trummlitz, Gunter; Seeger, Ernst; and Engel, Wolfhard, 4,430,355, Cl. 426-548.000.

Dodd, P. David: *See*—
Coulson, Richard L.; Blickenstaff, Ronald L.; Dodd, P. David; Moreno, Robert J.; and Kinard, Dean P., 4,430,712, Cl. 364-300.000.

Dodelin, Richard W.; Hurst, Darrell W.; and Osos, George R., to Dodelin, Richard W. Solar dryer. 4,429,472, Cl. 34-48.000.

Doerge, Herman P., to PPG Industries, Inc. Polyether polyols and their method of preparation. 4,430,490, Cl. 528-77.000.

Dohi, Takashi; Shinozaki, Nozomu; and Neki, Shigeo, to Matsushita Electric Industrial Co., Ltd. Electromagnetic clutch and brake. 4,429,773, Cl. 192-18.00B.

Doi, Keiichiro: *See*—
Kondo, Shigeki; Yamazaki, Yoshio; Iketani, Tomofumi; Tanaka, Seiji; and Doi, Keiichiro, 4,430,542, Cl. 219-10.770.

Dolman, Rodney A.; and Mears, Gregory N., to General Electric Company. Oscillator control circuit. 4,430,756, Cl. 455-78.000.

Dominguez, Richard L. Tracking reflector assembly for a skylight. 4,429,952, Cl. 350-258.000.

Dongelmans, Anthony A., to Challenge-Cook Brothers, Inc. Door-operating mechanism. 4,430,002, Cl. 366-139.000.

Dopfer, Maximilian; and Heidrich, Gunther, to BHS-Bayerische Berg, Hutten-und Salzwerke Aktiengesellschaft. Double-oblique-toothed two-stage spur wheel drive. 4,429,586, Cl. 74-410.000.

Dorn, Wolfgang; Elsner, Fritz; Fischer, Klaus; and Kroschel, Heinz, to Dynamit Nobel Aktiengesellschaft. Mine, especially antitank mine. 4,429,635, Cl. 102-401.000.

Dorner, Heinrich; and Rabe, Gunter, to Kraftwerk Union Aktiengesellschaft. Reactor pressure vessel for a boiling-water reactor. 4,429,663, Cl. 122-365.000.

Dorner, Karl H.: *See*—
Buysch, Hans-Josef; Illger, Hans-Walter; and Dorner, Karl H., 4,430,452, Cl. 521-107.000.

Dorr-Oliver Incorporated: *See*—
Willus, Charles A.; Lewis, Kenneth D.; and Langer, Julian, 4,430,071, Cl. 494-38.000.

Dorros, Gerald; and Spring, Donald A., to Cardiovascular Diagnostic Services, Inc. Pressure generator for intravascular dilator. 4,429,724, Cl. 141-27.000.

Doty, Myron L., to Moorfeed Corporation. Dual drive rotary feeder. 4,429,808, Cl. 221-167.000.

Doucet, Charles. Disc filter for liquids. 4,430,232, Cl. 210-798.000.

Douglass, Samuel Ernest: *See*—
Mooring, William L., 4,430,074, Cl. 604-49.000.

Dow Chemical Co., The: *See*—
Burba, John L., III, 4,430,097, Cl. 55-67.000.
Burnett, Edward L.; and Stack, Eugene V., 4,430,283, Cl. 264-127.000.
Caldwell, Donald L., 4,430,315, Cl. 423-499.000.

Frenier, Wayne W.; and Wilson, David A., 4,430,128, Cl. 134-3.000.
Lee, John M.; and Bauman, William C., 4,430,311, Cl. 423-179.500.
McIntyre, James A.; Phillips, Robert F.; and Lefevre, Joseph D., 4,430,177, Cl. 204-98.000.
McKinney, Osborne K.; and Flores, David P., 4,430,289, Cl. 264-564.000.
Stack, Eugene V., 4,430,282, Cl. 264-127.000.

Downing, Edward J.: *See*—
Crawford, George H.; Downing, Edward J.; and Schlemmer, Roy G., 4,430,366, Cl. 427-162.000.

Dowty Mining Equipment Limited: *See*—
Hill, Nigel; and Rutherford, Dennis F., 4,430,026, Cl. 405-291.000.

Dracka, Oldrich: *See*—
Mackrle, Svatopluk; Mackrle, Vladimir; and Dracka, Oldrich, 4,430,215, Cl. 210-195.400.

Dransfeld, Klaus F. K.: *See*—
Bimberg, Dieter H.; Bubenzer, Achim; Dransfeld, Klaus F. K.; and Hunklinger, Siegfried, 4,429,999, Cl. 356-432.000.

Drauz, Karlheinz: *See*—
Bethge, Horst; Drauz, Karlheinz; Kleemann, Axel; Martens, Jurgen; and Weigel, Horst, 4,430,509, Cl. 562-401.000.

Drave, Heinz: *See*—
Krist, Otto; Drave, Heinz; and Luypaert, Jozef, 4,430,438, Cl. 501-17.000.

Dresser Industries, Inc.: *See*—
Kleeb, Thomas R., 4,430,439, Cl. 501-95.000.
Oliver, Donald W.; and Chace, David M., 4,430,567, Cl. 250-270.000.

Drexel Oil Field Service (HK) Limited: *See*—
Armell, Richard A.; and Misselbrook, John G., 4,429,566, Cl. 73-40.700.

Dril-Quip, Inc.: *See*—
Reimert, Larry E., 4,429,904, Cl. 285-24.000.

DSO "IZOT": *See*—
Jelezov, Jivko Y.; and Bogdanov, Todor D., 4,429,821, Cl. 226-181.000.

Du Pont Canada Inc.: *See*—
Zboril, Vaclav G., 4,430,488, Cl. 526-84.000.

Dubeck, Michael; and Knapp, Gordon G., to Ethyl Corporation. Sulfide-modified ruthenium catalyst. 4,430,253, Cl. 502-185.000.

Dubois, Jean-Claude: *See*—
Billard, Jean; Dubois, Jean-Claude; Hareng, Michel; Le Berre, Serge; and Perbet, Jean-Noel, 4,430,650, Cl. 340-784.000.

DuBow, Joel. Process for enhancing the thermal decomposition of solid matter. 4,430,160, Cl. 201-19.000.

Dubray, Norman. Trap setting device. 4,429,485, Cl. 43-97.000.

Duffy, Peter B. Medical appliance for percussive respiratory therapy. 4,429,688, Cl. 128-28.000.

Dufilho, Harold L.: *See*—
Guagliardo, John L.; and Dufilho, Harold L., 4,429,994, Cl. 356-28.500.

Dunbar, David R., to Interpace Corporation. Electrical transmission system conductor installation technique. 4,429,858, Cl. 254-134.3PA.

Duncombe, George R.; Line, William F.; and Chicoye, Etzer, to Miller Brewing Company. Immobilized glucoamylase reactor for preparing a low calorie beer. 4,430,348, Cl. 426-13.000.

Du Pont de Nemours, E. I., and Company: *See*—
Goff, David L., 4,430,418, Cl. 430-288.000.
Hughes, Allan B.; and Dear, Terrence A., 4,429,714, Cl. 137-625.300.
Schumacher, Frederick G., 4,430,468, Cl. 524-109.000.
Schurr, George A., 4,430,001, Cl. 366-107.000.
Yunan, Malak E., 4,429,632, Cl. 102-202.130.

Duracell Inc.: *See*—
Schoolcraft, Robert J., 4,430,399, Cl. 429-218.000.

Durante, Vincent A.; Olszanski, Dennis J.; Reagan, William J.; and Brown, Stanley M., to Engelhard Corporation. Passivation of contaminant metals on cracking catalysts by phosphorus addition. 4,430,199, Cl. 208-114.000.

Durr, Frederick E.: *See*—
Murdock, Keith C.; and Durr, Frederick E., 4,430,501, Cl. 544-72.000.

Dutton, Edmund L., to Mallinckrodt, Incorporated. Interactive dual probe temperature control system. 4,429,829, Cl. 236-78.00B.

Dyck, Arthur, to Gunstream Industries, Inc. Clutch and multiple speed capstan tape drive mechanism and tape position indicator for tape transport. 4,429,822, Cl. 226-188.000.

Dynamit Nobel Aktiengesellschaft: *See*—
Dorn, Wolfgang; Elsner, Fritz; Fischer, Klaus; and Kroschel, Heinz, 4,429,635, Cl. 102-401.000.

Eagle Industry Co., Ltd.: *See*—
Matsumoto, Sotosuke, 4,429,884, Cl. 277-93.0SD.

Early, John D., to Bethlehem Steel Corporation. Ceramic furnace door and frame. 4,429,641, Cl. 110-181.000.

Eastman Kodak Company: *See*—
Adin, Anthony, 4,430,420, Cl. 430-351.000.
Newkirk, James S.; and Wiederhold, Robert A., 4,430,406, Cl. 430-99.000.
Tamary, Ernest J., 4,429,990, Cl. 355-14.0FU.

Eaton Corporation: *See*—
Forsell, Kenneth A.; Grass, William E.; Theisen, Peter J.; and Fajner, Michael J., 4,430,631, Cl. 335-16.000.
Rusenko, James J.; and Rzepecki, Marian M., 4,429,936, Cl. 339-45.00R.

Eberbach, Steven J. Loudspeaker crossover delay equalization. 4,430,527, Cl. 381-97.000.

Ebey, Frank S.: *See*—
Christensen, Dean L.; and Ebey, Frank S., 4,429,790, Cl. 206-444.000.

Ebi, Masashi, to Pacific Engineering Co., Ltd. Time delay fuse. 4,430,633, Cl. 337-166.000.

Echlin Inc.: *See*—
Loganbill, Ernest L.; and Taylor, William E., 4,430,604, Cl. 318-379.000.

Eck, Gary A.; and Fritz, Gary R., to Kimball International, Inc. Fill note generation system for microcomputer controlled organ. 4,429,604, Cl. 84-1.170.

Eckstein, Arthur. Skier's exercise device. 4,429,869, Cl. 272-97.000.

Ecological Professional Industries, Inc.: *See*—
Wagner, Louis E.; Rakoczynski, Randolph W.; and Flannery, Harold F., 4,430,021, Cl. 405-129.000.

Edamura, Takao: *See*—
Nakagawa, Nobuo; Kato, Yoshiki; Abe, Katsuo; Edamura, Takao; and Nakamura, Takao, 4,430,387, Cl. 428-579.000.

Edelton, Soren; and Peterson, Bo, to Aktiebolaget Bofors. Impact igniter. 4,429,633, Cl. 102-222.000.

Edso, Lennart. Method and apparatus for monitoring a press. 4,429,627, Cl. 100-35.000.

Eguchi, Yasukata; and Shomura, Eiichi, to Janome Sewing Machine Industry Co., Ltd. Assembly for lower thread tension adjustment of sewing machine. 4,429,649, Cl. 112-229.000.

Ehmann Corporation: *See*—
Ehmann, Emil G., 4,429,793, Cl. 206-570.000.

Ehmann, Emil G., to Ehmann Corporation. Diabetic traveling case. 4,429,793, Cl. 206-570.000.

Ehrl, Winfried; and Jung, Siegfried, to Hoechst Aktiengesellschaft. Fluorine-containing alkylsulfobetaines, a process for their preparation and their use. 4,430,272, Cl. 260-501.120.

Eichelberger, Charles W.; and Wojnarowski, Robert J., to General Electric Company. Cooking apparatus having internal pressurizing source and integral heat source . 4,430,557, Cl. 219-401.000.

Eickmeyer, Allen G. Removal of CO_2 from gas mixtures. 4,430,312, Cl. 423-223.000.

Eidetic Images, Inc.: *See*—
Haines, Kenneth A., 4,429,946, Cl. 350-3.760.

Eilers, Carl-Ernst; and Pachonik, Horst, to Siemens Aktiengesellschaft. Device for cathode sputtering of at least two different materials. 4,430,190, Cl. 204-298.000.

Eim Company, Inc.: *See*—
Zuch, Howard W.; and Weber, Paul, 4,429,591, Cl. 74-625.000.

Eistetter, Klaus; and Rapp, Erich, to Byk Gulden Lomberg Chemische Fabrik Gesellschaft mit beschrankter Haftung. Substituted oxiranecarboxylic acids, their preparation and their use as medicaments. 4,430,339, Cl. 424-278.000.

Eldering, Herman G.; and Kliman, Arthur W., to Baird Corporation. Radiation measuring system. 4,430,000, Cl. 356-236.000.

Eldre Components, Inc.: *See*—
Bader, Craig C., 4,430,522, Cl. 174-72.00B.

Electric Power Research Institute, Inc.: *See*—
Kinnan, Frank, 4,430,022, Cl. 405-183.000.

Electro Audio Dynamics, Inc.: *See*—
von Recklinghausen, Daniel R., 4,429,702, Cl. 128-746.000.

Eli Lilly and Company: *See*—
Cooper, Robin D. G., 4,430,268, Cl. 260-239.00A.
Frank, Bruce H., 4,430,266, Cl. 260-112.700.
Frederickson, Robert C. A., 4,430,327, Cl. 424-177.000.
Miller, Jack R., 4,430,113, Cl. 71-92.000.
Pearce, Homer L., 4,430,269, Cl. 260-244.400.
Scheifinger, Curtis C., 4,430,328, Cl. 424-177.000.
Wheeler, William J., 4,430,499, Cl. 544-25.000.

Elliott, Jo A.; McInroy, John W.; and Waldo, Paul D., to International Business Machines Corporation. Method for displaying source and destination file headers for easy comparison of proposed header changes. 4,430,725, Cl. 364-900.000.

Ellsberg, Thomas R. Vehicle lock release mechanism operable with a safety interlock system. 4,430,685, Cl. 361-172.000.

Elmore, Ernest L.: *See*—
Mills, Edwin R.; and Elmore, Ernest L., 4,430,560, Cl. 219-505.000.

Elphora: *See*—
Szakvary, Laszlo, 4,430,757, Cl. 455-100.000.

Elsner, Fritz: *See*—
Dorn, Wolfgang; Elsner, Fritz; Fischer, Klaus; and Kroschel, Heinz, 4,429,635, Cl. 102-401.000.

Elston, Ronald W., to Transequip Limited. Cargo container cover. 4,429,730, Cl. 160-368.00R.

Emerson Electric Co.: *See*—
Butterfield, Roger P., 4,429,595, Cl. 74-804.000.
Stover, John C.; and Borkoski, Paul J., 4,429,845, Cl. 246-428.000.

Empex Mineral-Und Naturfaserprodukts AG: *See*—
Hascic, Waldemar, 4,430,125, Cl. 106-81.000.

Empresa Nacional del Aluminio, S.A.: *See*—
Gazapo Santa-Olalla, Jose L.; Gonzalez Feliu, Juan; and de Miguel Lopez, Isidoro, 4,430,168, Cl. 204-35.00N.

Emundts, Horst; Hoyer, Manfred; and Vogel, Walter, to Klockner-Humboldt-Deutz Aktiengesellschaft. Steering wheel for a motor vehicle, particularly for a tractor. 4,429,588, Cl. 74-484.00R.

Enders, John A., to Choice-Vend Industries, Inc. Adjustable dispensing mechanism for vending machine. 4,429,807, Cl. 221-75.000.

Enemark, Robert B., to American District Telegraph Company. Forward scatter smoke detector. 4,430,646, Cl. 340-630.000.

Energy Conversion Devices, Inc.: *See*—
Ovshinsky, Stanford R.; Sapru, Krishna; and Venkatesan, Srinivasan, 4,430,391, Cl. 429-40.000.
Engel, Wolfhard: *See*—
Trummlitz, Gunter; Seeger, Ernst; and Engel, Wolfhard, 4,430,355, Cl. 426-548.000.
Engelhard Corporation: *See*—
Cohn, Johann G. E., 4,430,188, Cl. 204-290.00F.
Durante, Vincent A.; Olszanski, Dennis J.; Reagan, William J.; and Brown, Stanley M., 4,430,199, Cl. 208-114.000.
Fekete, Imre, deceased, 4,430,390, Cl. 429-34.000.
Engels, Rainer; and Meura, Jan H. H., to Shell Oil Company. Preparation of isocyanates and/or derivatives thereof. 4,430,262, Cl. 260-453.00P.
English Clays Lovering Pochin & Co., Ltd.: *See*—
Gate, Leonard F., 4,430,249, Cl. 252-313.00R.
English, James C.: *See*—
Beyer, William F.; Dankert, Harry S.; and English, James C., 4,429,584, Cl. 73-864.210.
Enomoto, Seiji: *See*—
Mogi, Jun-ichi; Miyasaka, Kiyoshi; Enomoto, Seiji; and Nozaki, Shigeki, 4,430,581, Cl. 307-296.00R.
Enomoto, Shigeo; and Shimoda, Mitsuhiko, to Asahi Kogaku Kogyo Kabushiki Kaisha. Photographic camera of automatic focussing type. 4,429,965, Cl. 354-402.000.
Epsom, Robert L.; Gailus, Paul H.; and van den Heuvel, Anthony P., to Motorola, Inc. Adaptive radio frequency intermodulation minimizing apparatus. 4,430,619, Cl. 330-149.000.
Erdelyi, Janos: *See*—
Daroczy, Janos; Erdelyi, Janos; Havas, Jeno; Kecskes, Lajos; and Muller, Henrik, 4,430,164, Cl. 204-1.00T.
Erickson, Leland E. Multi-row crop harvesting attachment. 4,429,516, Cl. 56-95.000.
Erico Products, Inc.: *See*—
Laughlin, Raymond S.; and Lynch, Edward J., Jr., 4,429,440, Cl. 24-486.000.
Ernst, Friedrich, to C. Otto & Comp. G.m.b.H. Latching mechanism on coke oven doors. 4,429,908, Cl. 292-35.000.
Ernst Leitz Wetzlar GmbH: *See*—
Schaefer, K. Dieter, 4,429,964, Cl. 354-403.000.
Schick, Dieter, 4,429,993, Cl. 356-152.000.
Erpenbach, Heinz; Gehrmann, Klaus; Kubbeler, Hans-Klaus; and Schmitt, Klaus, to Hoechst Aktiengesellschaft. Production of acetic anhydride. 4,430,273, Cl. 260-546.000.
Escher Wyss Aktiengesellschaft: *See*—
Lehmann, Rolf, 4,429,446, Cl. 29-116.0AD.
Escher Wyss Limited: *See*—
Bubik, Alfred; and Reutter, Siegfried, 4,430,159, Cl. 162-292.000.
Spiewok, Leonhard, 4,430,221, Cl. 210-380.100.
Eskandry, Ezra D.; and Weaver, Jon N., to Sensormatic Electronics Corporation. Surveillance system employing a dual function floor mat radiator. 4,430,645, Cl. 340-572.000.
Essex Group, Inc.: *See*—
Tinder, David V., 4,429,570, Cl. 73-119.00A.
ETA S.A. Fabriques d'Ebauches: *See*—
Muller, Jacques, 4,430,009, Cl. 368-203.000.
Wiget, Fridolin; and Guerin, Yves, 4,430,007, Cl. 368-157.000.
Ethyl Corporation: *See*—
Dubeck, Michael; and Knapp, Gordon G., 4,430,253, Cl. 502-185.000.
Eutectic Corporation: *See*—
Pauga, Uldis, 4,430,122, Cl. 75-123.00B.
Eve, Michel; and Flosh, Bernard, to Lignes Telegraphiques Et Telephoniques. Device for separating two light signals emitted by sources having different wavelengths and transmitted in a single optical fiber. 4,430,572, Cl. 250-551.000.
Evers, Heinz, to Wiederaufbereitungsanlage Karlsruhe Betriebsgesellschaft mbH. Apparatus for removing a sample of at least one phase from a moving mixed phase. 4,430,301, Cl. 422-119.000.
Ewing, John J.: *See*—
Claassen, George R.; and Ewing, John J., 4,430,111, Cl. 65-114.000.
Frank, Robert G.; Claassen, George R.; Ewing, John J.; and Fecik, Michael T., 4,430,110, Cl. 65-104.000.
Excello Specialty Company, The: *See*—
Jones, Wallace R., 4,430,137, Cl. 156-247.000.
Exxon Production Research Co.: *See*—
Burkhardt, Joseph A.; Childers, Thomas W.; Hanson, Harry R.; and Harkrider, Bobby M., 4,429,620, Cl. 91-395.000.
Hayes, Donald A.; Finn, Lyle D.; and Brinkmann, Carl R., 4,430,023, Cl. 405-224.000.
Exxon Research and Engineering Company: *See*—
Felsky, Gerald, 4,430,205, Cl. 208-246.000.
Ryu, Ji-yong, 4,430,252, Cl. 502-162.000.
Sawyer, Willard H.; and Mitchell, Howard L., III, 4,430,442, Cl. 502-220.000.
Seiver, Robert L.; and Chianelli, Russell R., 4,430,443, Cl. 502-220.000.
Ezaki, Sazo, to Toyoda Gosei Co., Ltd. Channel-shaped trim. 4,430,374, Cl. 428-135.000.
F. D. International, Ltd.: *See*—
von Platen, Baltzar C., 4,430,051, Cl. 425-77.000.
FAG Kugelfischer Georg Schafer & Co.: *See*—
Kress, Manfred, 4,429,524, Cl. 57-336.000.
Spielmann, Norbert, 4,429,531, Cl. 60-588.000.
Fajner, Michael J.: *See*—
Forsell, Kenneth A.; Grass, William E.; Theisen, Peter J.; and Fajner, Michael J., 4,430,631, Cl. 335-16.000.
Falco, Charles M.: *See*—
Schuller, Ivan K.; and Falco, Charles M., 4,430,183, Cl. 204-192.00C.
Farber, Jurgen, to PLK Papier- und Kunstoff Werke Linnich GmbH. Beverage package. 4,429,828, Cl. 229-75.000.
Farmont, Johann H. Building logs with weathertight joints. 4,429,500, Cl. 52-233.000.
Fauss, Rudolf: *See*—
Heitkamper, Peter; Konig, Klaus; Findeisen, Kurt; Fauss, Rudolf; and Sundermann, Rudolf, 4,430,505, Cl. 560-24.000.
Featherstone, John L., to Magma Power Company. Geothermal plant silica control system. 4,429,535, Cl. 60-641.500.
Fechtig, Bruno: *See*—
Heusler, Karl; Bickel, Hans; Fechtig, Bruno; Peter, Heinrich; and Scartazzini, Riccardo, 4,430,498, Cl. 544-16.000.
Fecik, Michael T.: *See*—
Frank, Robert G.; Claassen, George R.; Ewing, John J.; and Fecik, Michael T., 4,430,110, Cl. 65-104.000.
Fedeli, Luisa. Blade structure, particularly for rotating grass shaving machines. 4,429,518, Cl. 56-295.000.
Feher, Joseph S. Automotive suspension system for maintaining the rear wheels substantially parallel to one another throughout use. 4,429,900, Cl. 280-689.000.
Fehlhaber, Jurgen: *See*—
Knoke, Jurgen; Buchwald, Holger; and Fehlhaber, Jurgen, 4,430,372, Cl. 428-90.000.
Fekete, Anna M., administrator: *See*—
Fekete, Imre, deceased, 4,430,390, Cl. 429-34.000.
Fekete, Imre, deceased (by Fekete, Anna M., administrator), to Engelhard Corporation. Compact fuel cell stack. 4,430,390, Cl. 429-34.000.
Feldhoff, Karl; and Peters, Paul, to L. & C. Steinmuller GmbH. Cooled shaking grate having no grate bar. 4,429,664, Cl. 122-376.000.
Feldman, Marvin: *See*—
Chen, Richard M.; and Feldman, Marvin, 4,429,880, Cl. 273-176.0FA.
Felsky, Gerald, to Exxon Research and Engineering Company. Method for the improvement of the oxidation resistance of hydrocarbon oil, especially transformer oils by the selective removal of pro-oxidant nitrogen and sulfur compounds therefrom. 4,430,205, Cl. 208-246.000.
Fender, Robert: *See*—
Klute, Friedrich; and Fender, Robert, 4,429,618, Cl. 91-1.000.
Ferguson, W. Gardner. Apparatus for integrally removing a track plate and spikes. 4,429,857, Cl. 254-18.000.
Ferkl, Frantisek; Cap, Antonin; Vecera, Milos; Skala, Josef; Kopriva, Vaclav; Blasko, Michal; Pavek, Karel; Chrtek, Milan; and Blasko, Jan, to Vyzkumny ustav bavlnarsky. Open-end spinning machine. 4,429,522, Cl. 57-301.000.
Ferrero S.p.A.: *See*—
Cillario, Lorenzo, 4,430,351, Cl. 426-103.000.
Ferrofluidics Corporation: *See*—
Wyman, John E., 4,430,239, Cl. 252-62.510.
Feuvray, Alain. Fastening device for a trailer and trailer comprising such a device. 4,429,894, Cl. 280-458.000.
Fichtel & Sachs AG: *See*—
Butz, Hans, 4,429,448, Cl. 29-281.500.
Fieldcrest Mills, Inc.: *See*—
Mills, Edwin R.; and Elmore, Ernest L., 4,430,560, Cl. 219-505.000.
Filz, Charles J.: *See*—
Bowman, Donald B.; Filz, Charles J.; and Osborn, James G., 4,430,098, Cl. 55-191.000.
Findeisen, Kurt, to Bayer Aktiengesellschaft. Preparation of α-dicyanotrimethylsilyloxy compounds. 4,430,503, Cl. 556-417.000.
Findeisen, Kurt: *See*—
Heitkamper, Peter; Konig, Klaus; Findeisen, Kurt; Fauss, Rudolf; and Sundermann, Rudolf, 4,430,505, Cl. 560-24.000.
Finn, George A., III; Kuneman, James E.; and Lawrence, Keith E., to General Electric Company. Attitude insensitive lubrication systems. 4,429,587, Cl. 74-467.000.
Finn, Lyle D.: *See*—
Hayes, Donald A.; Finn, Lyle D.; and Brinkmann, Carl R., 4,430,023, Cl. 405-224.000.
Fiorucci, Louis C., to Olin Corporation. Mixed nitrate salt heat transfer medium and process for providing the same. 4,430,241, Cl. 252-70.000.
Fischer, Artur. Box-shaped container for use as a cold frame. 4,429,489, Cl. 47-18.000.
Fischer, Artur. Fixing device for fastening objects on hollow boards. 4,429,505, Cl. 52-583.000.
Fischer, Carlin P., to Technicraft, Inc. End fitting for oil well sucker rods. 4,430,018, Cl. 403-268.000.
Fischer, Dieter, to Triumph-Adler A.G. fur Buround Informationstechnik. Image conversion apparatus with gas discharge switching. 4,430,564, Cl. 250-211.00R.
Fischer, Harry C. Ice maker. 4,429,543, Cl. 62-73.000.
Fischer, Klaus: *See*—
Dorn, Wolfgang; Elsner, Fritz; Fischer, Klaus; and Kroschel, Heinz, 4,429,635, Cl. 102-401.000.
Fischley, John; and Anderson, Tom E., to Republic Steel Corporation. Runner system for transferring molten metal. 4,429,860, Cl. 266-44.000.
Fisher, Charles B.; and Fisher, Sidney T. Heat transfer in gas compression. 4,429,546, Cl. 62-238.100.

Fisher, Charles B.; and Fisher, Sidney T. Demodulator system for double sideband suppressed carrier amplitude modulation. 4,430,620, Cl. 329-166.000.

Fisher, Sidney T.: *See—*
Fisher, Charles B.; and Fisher, Sidney T., 4,429,546, Cl. 62-238.100.
Fisher, Charles B.; and Fisher, Sidney T., 4,430,620, Cl. 329-166.000.

Flager, Calvin D. Bicycle seat. 4,429,915, Cl. 297-199.000.

Flanagan, Richard J.; and Wiebe, Leonard I., to Merck Frosst Canada Inc. 6-Bromocholesterol derivatives. 4,430,321, Cl. 424-1.100.

Flannery, Harold F.: *See—*
Wagner, Louis E.; Rakoczynski, Randolph W.; and Flannery, Harold F., 4,430,021, Cl. 405-129.000.

Flechner, Paul F., to AMF Incorporated. Hydraulic exerciser. 4,429,871, Cl. 272-130.000.

Fleischmann, Karl-Heinz, to Forbach GmbH & Co. KG. Electrical safety device for heaters with a high current consumption. 4,430,554, Cl. 219-483.000.

Fletcher, Argell, to Mobil Oil Corporation. Heated ion exchange process for the recovery of uranium. 4,430,308, Cl. 423-7.000.

Flor, Joseph R., to Midland-Ross Corporation. Locking device for interfitting members. 4,429,938, Cl. 339-90.00R.

Flores, David P.: *See—*
McKinney, Osborne K.; and Flores, David P., 4,430,289, Cl. 264-564.000.

Flosh, Bernard: *See—*
Eve, Michel; and Flosh, Bernard, 4,430,572, Cl. 250-551.000.

Flutec Fluidtechnische Gerate GmbH: *See—*
Litzenburger, Wolfgang, 4,430,220, Cl. 210-333.100.

Flynn, Edward P.: *See—*
Callaghan, Vincent M.; Flynn, Edward P.; and Pokora, Bohdan M., 4,430,293, Cl. 376-314.000.

FMC Corporation: *See—*
Castrantas, Harry M.; and Berkowitz, Sidney, 4,430,454, Cl. 521-107.000.

Forbach GmbH & Co. KG: *See—*
Fleischmann, Karl-Heinz, 4,430,554, Cl. 219-483.000.

Ford, James M.; and Wright, David B., to Olin Corporation. Portable method for filter press cell assembly. 4,430,179, Cl. 204-128.000.

Ford Motor Company: *See—*
Stocker, Raymond, 4,429,589, Cl. 74-513.000.

Forenade Fabriksverken: *See—*
Rammesten, Ivan O., 4,429,561, Cl. 72-478.000.

Forsell, Kenneth A.; Grass, William E.; Theisen, Peter J.; and Fajner, Michael J., to Eaton Corporation. Circuit breaker with increased current interrupting capacity. 4,430,631, Cl. 335-16.000.

Forster, Siegfried; and Quell, Peter, to Kernforschungsanlage Julich GmbH. Space and utility water heating system. 4,429,830, Cl. 237-19.000.

Foseco International Limited: *See—*
Simmons, William, 4,430,123, Cl. 75-130.00R.

Foster Wheeler Energy Corporation: *See—*
Gorzegno, Walter P., 4,430,094, Cl. 48-76.000.

Fowler, Rick. Remote load selector circuit and method. 4,430,576, Cl. 307-38.000.

Fox Pool Corporation: *See—*
Weir, Donald H.; and Dahowski, Donald E., 4,429,425, Cl. 4-503.000.

Frampton, William H.; and Bos, Alfred M. Sliding fifth wheel. 4,429,892, Cl. 280-407.000.

Franck, Heinz-Gerhard: *See—*
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Frank, Bruce H., to Eli Lilly and Company. Process for producing an insulin precursor. 4,430,266, Cl. 260-112.700.

Frank, Erich; Scheuermann, Walter; and Volk, Georg, to Metzeler Kautschuk GmbH. Device for testing the shore-hardness of rubber-like articles. 4,429,569, Cl. 73-81.000.

Frank, Robert G.; Claussen, George R.; Ewing, John J.; and Fecik, Michael T., to PPG Industries, Inc. Shaping sheets of glass or other deformable material to a compound curvature. 4,430,110, Cl. 65-104.000.

Franke, Alwis: *See—*
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Franklin Institute, The: *See—*
Pytlewski, Louis J.; and Thorne, Edward J., 4,430,208, Cl. 208-262.000.

Franks, T. Chandler, to Texize, Division of MortonThiokol. Liquid detergent composition containing bleach. 4,430,236, Cl. 252-95.000.

Franz, Dietmar; and Torggler, Norbert, to Siemens Aktiengesellschaft. Circuit arrangement for connecting telex subscriber stations to teletex subscriber stations which are connected to the same data exchange system. 4,430,525, Cl. 178-3.000.

Franz, Edward W., to Celotex Corporation. Variable density board having improved thermal and acoustical properties and method and apparatus for producing same. 4,430,286, Cl. 264-258.000.

Franz, Herbert; and Frister, Manfred, to Robert Bosch GmbH. Pressure-lubricated automotive-type alternator. 4,429,924, Cl. 308-187.000.

Fraser, Thomas H.; and Bruce, Barbara J., to Upjohn Company, The. Composition of matter and process. 4,430,428, Cl. 435-68.000.

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Frech, John W.: *See—*
Weigand, Benjamin F.; and Frech, John W., 4,430,642, Cl. 340-347.0DA.

Frederickson, Robert C. A., to Eli Lilly and Company. Method for treating pregnant females for pain and anxiety. 4,430,327, Cl. 424-177.000.

Freeburg, Thomas A.: *See—*
Milleker, William W.; Freeburg, Thomas A.; and Stepien, Michael A., 4,430,742, Cl. 375-5.000.

Freissmuth, Alfred; Gmohling, Werner; and Meichsner, Walter, to SKW Trostberg Aktiengesellschaft. Desulfurization agent. 4,430,118, Cl. 75-58.000.

Fremeaux, Jacques: *See—*
Vachet, Joel; Bruandet, Justin; and Fremeaux, Jacques, 4,429,509, Cl. 52-788.000.

French, Hartley A. Pipeline inspection and maintenance method including moving a magnetic field responsive device along the route of the pipeline. 4,430,613, Cl. 324-200.000.

Frenier, Wayne W.; and Wilson, David A., to Dow Chemical Company, The. Aqueous acid composition and method of use. 4,430,128, Cl. 134-3.000.

Freshwater, Lane A.; and Moynagh, Eugene E., to Minnesota Mining and Manufacturing Company. Tap connector. 4,429,940, Cl. 339-99.00R.

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Klute, Friedrich; and Fender, Robert, 4,429,618, Cl. 91-1.000.

Friedman, Donald M.; and Monner, Fred M. Variable terrain dolly. 4,429,897, Cl. 280-646.000.

Friedson, Belvin F.; Thaler, Arnold; and Saud, Ivan, to Save-Way Industries, Inc. Apparatus for treating the feet. 4,429,687, Cl. 128-24.200.

Frister, Manfred: *See—*
Franz, Herbert; and Frister, Manfred, 4,429,924, Cl. 308-187.000.

Fritsch, Horst, to Lewa Herbert Ott GmbH & Co. Diaphragm pump with a diaphragm clamped in pressure-balancing arrangement. 4,430,048, Cl. 417-383.000.

Fritz, Gary R.: *See—*
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Fritz, William E.; and Soddy, Thomas C., to Youngstown Steel Door Company, The. Sliding bearing and seal. 4,429,921, Cl. 308-3.500.

Frost, Jonathan R.: *See—*
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Fruchter, Moshe; and Moscovici, Anutza. Process for the manufacture of pure metallic aluminum from aluminum ores and other aluminum-bearing materials. 4,430,120, Cl. 75-68.00B.

Frund, Louis; and Bruggmann, Remy, to Atelier de Construction Steiger S.A. Cam-support carriage for a knitting machine. 4,429,553, Cl. 66-78.000.

Fuchs, Hermann: *See—*
Mischke, Peter; Fuchs, Hermann; and Meininger, Fritz, 4,430,259, Cl. 260-186.000.

Fuchs, Uwe, to Linde Aktiengesellschaft. Process and apparatus for biologically treating waste waters. 4,430,224, Cl. 210-604.000.

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Ono, Yoshihiro; and Sunagawa, Hiroshi, 4,430,405, Cl. 430-95.000.
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Fujii, Akio: *See—*
Umezawa, Hamao; Takeuchi, Tomio; Kondo, Shinichi; Iinuma, Hironobu; Ikeda, Daishiro; Nakamura, Teruya; and Fujii, Akio, 4,430,346, Cl. 424-311.000.

Fujikawa, Tatsuhichi, to Fukui Byora Co. Stud bolt for metal panels. 4,430,034, Cl. 411-179.000.

Fujime, Toshiro, to Sanyo Electric Co., Ltd. Still picture recording and reproducing system. 4,430,675, Cl. 358-342.000.

Fujimura, Akira: *See—*
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Fujitsu Limited: *See—*
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Mogi, Jun-ichi; Miyasaka, Kiyoshi; Enomoto, Seiji; and Nozaki, Shigeki, 4,430,581, Cl. 307-296.00R.
Okano, Takashi, 4,430,152, Cl. 156-643.000.

Fujiwara, Hiroshi, to Olympus Optical Co., Ltd. Illuminating light amount controllable retinal camera. 4,429,970, Cl. 354-413.000.

Fujiwara, Toshihide: *See—*
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Fukamachi, Masaaki: *See—*
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Fukazawa, Takao; and Ishikawa, Chuji, to Ricoh Company, Ltd. Apparatus for detecting deflection of a charged ink droplet. 4,430,658, Cl. 346-75.000.

Fukuda, Mitsuo: *See—*
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Fukuda, Toshikazu: *See*—
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Fukuzawa, Tadashi; Nakamura, Michiharu; and Takahashi, Susumu, to Hitachi, Ltd. Semiconductor laser device. 4,430,741, Cl. 372-46.000.
Fuminier, Claude B., to Pont-a-Mousson S.A. Machine for removing burrs from pipe. 4,429,445, Cl. 29-33.00T.
Furmaga, Robert E., to Baker CAC, Inc. Multiphase flow measurement system. 4,429,581, Cl. 73-861.040.
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G.B. Boucherie, Firma: *See*—
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GAF Corporation: *See*—
Jackey, Philip A.; and Canfield, V. Robert, 4,430,158, Cl. 162-156.000.
Gaffar, Abdul; and Davis, Calvin B., to Colgate-Palmolive Company. Topical treatment of skin lesions. 4,430,325, Cl. 424-128.000.
Gagnon, Stephen J.: *See*—
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Gaihier, Denis: *See*—
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Gallagher, John E., to General Electric Company. Thermoplastic molded part with stress reducing juncture. 4,430,370, Cl. 428-35.000.
Gamer, Gerold, to Brown, Boveri & Cie Aktiengesellschaft. Method of cleaning hollow conductors of cooled electrical machines. 4,430,129, Cl. 134-22.190.
Gancy, Alan B. Novel road and highway deicer and traction agent, and process for its manufacture. 4,430,242, Cl. 252-70.000.
Ganz, William; Solar, Ronald J.; and Lieber, Clement, to American Hospital Supply Corporation. Infusion catheter. 4,430,083, Cl. 604-283.000.
Ganzi, Gary C.: *See*—
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Garcia, Gilbert C., to Ramos, Homer, a part interest. Collapsible sawhorse. 4,429,765, Cl. 182-153.000.
Gardner, Beth A.: *See*—
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Garey, Kenneth E.: *See*—
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Garland, Barbara R.; and Troutman, Mark D., to Westinghouse Electric Corp. Water reducible modified polyester resin. 4,430,368, Cl. 427-385.500.
Garner, John N.; Roberge, Jean M.; and Axiuk, Oleg, to Northern Telecom Limited. Forming cable core units. 4,429,519, Cl. 57-293.000.
Garner, John N.; and Roberge, Jean M., to Northern Telecom Limited. Apparatus for stranding at least two wires together. 4,429,520, Cl. 57-293.000.
Garwin, Richard L., to International Business Machines Corporation. Optical alignment compensation. 4,429,948, Cl. 350-6.800.
Gate, Leonard F., to English Clays Lovering Pochin & Co., Ltd. Preparation of aqueous suspensions of talc. 4,430,249, Cl. 252-313.00R.
Gauthier-Lafaye, Jean; and Perron, Robert, to Rhone-Poulenc Industries. Hydrocarbonylation/carbonylation of alkyl carboxylates. 4,430,506, Cl. 560-105.000.
Gazapo Santa-Olalla, Jose L.; Gonzalez Feliu, Juan; and de Miguel Lopez, Isidoro, to Empresa Nacional del Aluminio, S.A. Process for electrolytically coloring aluminium and the alloys thereof. 4,430,168, Cl. 204-35.00N.
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Gehrmann, Klaus: *See*—
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General Electric Company: *See*—
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Nestor, Charles R., 4,429,945, Cl. 339-252.00R.
Gentet, Pierre; Geoffroy, Alain Y.; and Caillebotte, Alain M., to Societe Nationale Industrielle Aerospatiale. System for braking an aircraft taxiing on the ground. 4,430,715, Cl. 364-426.000.
Gentry, Cecil C.; and Small, William M., to Phillips Petroleum Company. Heat exchanger. 4,429,739, Cl. 165-159.000.
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Gentet, Pierre; Geoffroy, Alain Y.; and Caillebotte, Alain M., 4,430,715, Cl. 364-426.000.
George, Stephen, to Subtex, Inc. Flame resistant insulated electrical wire and cable construction. 4,430,384, Cl. 428-377.000.
Georgia Tech Research Institute: *See*—
Tedder, Daniel W., 4,430,102, Cl. 62-24.000.
Gereg, Charles V., to Barden Corporation, The. Eddy current bearing ball flaw detector. 4,430,614, Cl. 324-238.000.
Gerhard Kosche: *See*—
Boyes, David, 4,430,371, Cl. 428-61.000.
Gibbs, Thomas T. Physical exercising apparatus. 4,429,870, Cl. 272-117.000.
Giessen, Bill C.: *See*—
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Gilbert, Jack J. Gaseous mixture from liquid fuel and air. 4,430,095, Cl. 48-180.00C.
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Gimple, Irving; and Rodman, William, to Manitoba Telephone System, The. Video and data distribution module with subscriber terminal. 4,430,731, Cl. 370-30.000.
Gist Brocades NV: *See*—
Sanders, Johan P. M.; and Docherty, Andrew J. P., 4,430,434, Cl. 435-253.000.
GIW Southern Valve, Inc.: *See*—
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Glavic, Joseph J. Device for cutting vinyl sheet flooring. 4,429,461, Cl. 30-289.000.
Gleason, Robert T.; and Linde, Harold G., to International Business Machines Corporation. Method of forming an RIE etch barrier by in situ conversion of a silicon containing alkyl polyamide/polyimide. 4,430,153, Cl. 156-643.000.
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Goff, David L., to Du Pont de Nemours, E. I., and Company. Radiation-sensitive polyimide precursor composition derived from a diaryl fluoronated diamine compound. 4,430,418, Cl. 430-288.000.
Gohlert, Christian; Kanngiesser, Peter; Weiss, Hansjakob; and Wilke, Werner, to Interatom, Internationale Atomreaktorbau GmbH. Acoustic transducer. 4,430,593, Cl. 310-327.000.
Goldsmith, Derek J., to Goldsmith Patent Holdings (Sevenoaks) Limited. Fluid flow control valve. 4,429,715, Cl. 137-625.170.
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Goldsmith, Derek J., 4,429,715, Cl. 137-625.170.
Goldstein, Shyke A.: *See*—
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Goodridge, Paul A., to Owens-Corning Fiberglas Corporation. Spinner rotating apparatus. 4,430,106, Cl. 65-15.000.

Goodstine, Stephen L.; and Jukkola, Glen D., to Conoco Inc. Fluidized bed air distributor. 4,429,471, Cl. 34-10.000.

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Lin, Leroy C., 4,430,277, Cl. 264-22.000.
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Goor, Daniel; and Mohr, Raphael. Method and apparatus for measuring the systemic vascular resistance of a cardiovascular system. 4,429,701, Cl. 128-713.000.

Goransson, Bengt. Apparatus for disintegrating and mixing foodstuffs. 4,429,836, Cl. 241-282.100.

Gorga, Kevin J., to International Business Machines Corporation. Apparatus for obtaining multicolor raster images using a voltage penetration screen CRT. 4,430,667, Cl. 358-73.000.

Gorzegno, Walter P., to Foster Wheeler Energy Corporation. Vapor generating system having a plurality of integrally formed gasifiers extending to one side of an upright wall of the generator. 4,430,094, Cl. 48-76.000.

Gosteli, Jacques, to Schering Corporation. Process for the preparation of 2-(2,4-dichlorophenoxy)-phenylacetic acid. 4,430,510, Cl. 562-465.000.

Goto, Hiraku; Usui, Tsuneaki; and Kinoshita, Nobuyasu, to Asahi Kasei Kogyo Kabushiki Kaisha; and Akebono Process Co. Ltd. Transfer element for sandblast carving. 4,430,416, Cl. 430-263.000.

Gotoh, Osamu; Otobe, Yutaka; Kawamoto, Michio; and Fujimura, Akira, to Honda Giken Kogyo Kabushiki Kaisha. Exhaust gas recirculation control system for vehicle engines. 4,429,676, Cl. 123-571.000.

Goulas, Apostolos, to National Research Development Corporation. Two dimensinal flow analyzer. 4,429,995, Cl. 356-343.000.

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Graczyk, Bronislaus S., to Trico Products Corporation. Windshield wiper arm to blade connector. 4,429,431, Cl. 15-250.320.

Granryd, Eric, to AB Thermia-Verken. Arrangement in a heat pump plant. 4,429,547, Cl. 62-238.600.

Grant, Gerald B.; and Brune, Robert A., Jr., to Victor Equipment Company. Traction drive for traveling torch or the like. 4,429,585, Cl. 74-191.000.

Grant, Seamus M.: *See*—
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Gras, Augustin H., to Lauragri S.A. Metallized bottom container and process of obtaining the same. 4,430,134, Cl. 156-224.000.

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Grawe, Ardell M. Animal snare support. 4,429,484, Cl. 43-87.000.

Gray, Michael L.; and McClintock, William A., to Phillips Petroleum Company. Cryogenic recovery of LPG from natural gas. 4,430,103, Cl. 62-28.000.

Gray, Thomas J., to Olin Corporation. Electrolytic cell with improved hydrogen evolution cathode. 4,430,186, Cl. 204-242.000.

Great Lakes Carbon Corporation: *See*—
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Green, David T., to United States Surgical Corporation. Surgical instruments. 4,429,695, Cl. 128-305.000.

Greenbelt Farm Systems Inc.: *See*—
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Greenspan, Donald J. Child safe container-closure unit. 4,429,800, Cl. 215-216.000.

Greiner, Leonard. Chemical heat pump. 4,429,684, Cl. 126-429.000.

Grenner, Dieter: *See*—
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Grieves, Robert G.; and Richter, Roscoe, to GIW Southern Valve, Inc. Slurry gate valve. 4,429,710, Cl. 137-375.000.

Griffith, Frederick L. F., to Griffith, Frederick L. F. Process for repairing body parts on vehicles or the like. 4,430,133, Cl. 156-94.000.

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Grosser, Heinrich, to Thyssen Industrie AG Henschel. Apparatus for transporting ammunition to a top-mounted gun. 4,429,616, Cl. 89-36.00K.

Grover, Bruce C., to Litton Systems, Inc. Nuclear magnetic resonance gyro scope. 4,430,616, Cl. 324-304.000.

Growdon, John H.; and Wurtman, Richard J., to Massachusetts Institute of Technology. Process and composition for treating disorders by administering a phenothiazine and choline. 4,430,330, Cl. 424-199.000.

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GTE Laboratories Incorporated: *See*—
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Guerin, Yves: *See*—
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Guicherd, Christian: *See*—
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Guild, Charles L.; Werthessen, Nicholas H.; and Aldrich, Carlton W., Jr., to American Pile Driving Corporation. Hydraulically operated mandrels. 4,430,024, Cl. 405-232.000.

Gulf Oil Corporation: *See*—
Oltrogge, Robert D., 4,430,195, Cl. 208-8.00R.

Gulistan, Bulent. Tamper-proof screw assembly. 4,429,600, Cl. 81-461.000.

Gunsolus, Chee C. Surgical hanger. 4,429,848, Cl. 248-75.000.

Gunstream Industries, Inc.: *See*—
Dyck, Arthur, 4,429,822, Cl. 226-188.000.

Gutierrez, Manuel; and Gutierrez, Michael A. Volumetric filter for liquid level measurement devices. 4,430,212, Cl. 210-104.000.

Gutierrez, Michael A.: *See*—
Gutierrez, Manuel; and Gutierrez, Michael A., 4,430,212, Cl. 210-104.000.

Gutner, Kenneth H. Bracket for securing a mattress supporting member to a bedpost. 4,429,426, Cl. 5-288.000.

Guzy, Raymond L., to Hughes Tool Company. Elastomeric compositions with improved chemical, water and heat resistance. 4,430,472, Cl. 524-483.000.

H. R. Electronics Company: *See*—
Levasseur, Joseph L., 4,429,778, Cl. 194-10.000.

Haas, Peter: *See*—
Seifert, Peter; and Haas, Peter, 4,430,453, Cl. 521-107.000.

Haber, William. Cigarette substitute. 4,429,703, Cl. 131-273.000.

Hachiya, Tomoyoshi: *See*—
Saito, Hideomi; Yamamoto, Tomoya; Nomura, Masayuki; and Hachiya, Tomoyoshi, 4,430,500, Cl. 544-25.000.

Hack, Joachim; Brotzler, Roland; Schulze-Berge, Klaus; and Angermann, Rudolf, to BASF Aktiengesellschaft. Drive apparatus for recording disks in which the disk is clamped between a driven recessed member and a rotatably mounted clamping member. 4,430,678, Cl. 360-99.000.

Haddock, Louis A., Jr.; and Jones, Ronald L., to Clark Equipment Company. Seat and control lever interlock. 4,429,761, Cl. 180-271.000.

Hagio, Takehiko; and Miyahara, Michito, to Nippon Tungsten Co., Ltd. Process for producing zirconia yttria grinding media used for grinding magnetic coating powder. 4,430,279, Cl. 264-65.000.

Hahnle, Reinhard: *See*—
Buhler, Ulrich; Hahnle, Reinhard; Ribka, Joachim; and Richter, Helmut, 4,430,090, Cl. 8-508.000.

Haines, Kenneth A., to Eidetic Images, Inc. Method and system for constructing a composite hologram. 4,429,946, Cl. 350-3.760.

Haire, Christopher A. R.: *See*—
Payne, Robert M.; and Haire, Christopher A. R., 4,430,695, Cl. 362-277.000.

Hajek, Josef, to M.A.N.-ROLAND Druckmaschinen Aktiengesellschaft. Printing machine milling roller drive system. 4,429,630, Cl. 101-216.000.

Hajimoto, Yoshioki: *See*—
Nakatsui, Hisashi; and Hajimoto, Yoshioki, 4,430,666, Cl. 358-44.000.

Hale, Warren F.: *See*—
Brode, George L.; Chow, Sui-Wu; and Hale, Warren F., 4,430,473, Cl. 524-492.000.

Hall, John B.: *See*—
Sprecker, Mark A.; and Hall, John B., 4,430,508, Cl. 560-256.000.

Halldorsson, Ragnar: *See*—
Snaeland, Sveinn; Halldorsson, Ragnar; Franke, Alwis; and Gudmundsson, Einar, 4,430,187, Cl. 204-243.00R.

Hallen Company: *See*—
Allen, Herbert, 4,429,444, Cl. 29-33.00F.

Halliburton Company: *See*—
Beck, Harold K., 4,429,748, Cl. 166-324.000.

Halliburton, Ronald D.; Pearson, James H.; and Sava, Robert J., to Bally Manufacturing Corporation. Pinball machine and play feature thereof. 4,429,876, Cl. 273-121.00A.

Halmos, George G. Coil upender. 4,430,040, Cl. 414-783.000.
Halvorson, Harlan L. Adjustable tree stand. 4,429,846, Cl. 248-524.000.
Hamacher, Martin. Illuminating device for underground mining. 4,430,693, Cl. 362-61.000.
Hamilton Glass Products Incorporated: *See*—
Ruppel, Anthony D.; Williams, Monte; and Willis, Larry, 4,429,791, Cl. 206-454.000.
Hamilton, Stephen P.; Hunter, Arthur C.; and Lies, Kenneth A., to Texas Instruments Incorporated. Memory interface system having combined command, address and data buss. 4,430,724, Cl. 364-900.000.
Hammarberg, Lars. Reinforced beam section and a method of producing it. 4,430,373, Cl. 428-113.000.
Hammond, Peter M.; Price, Christopher P.; and Scawen, Michael D., to Public Health Laboratory Service Board. Production of aryl acylamidases. 4,430,433, Cl. 435-228.000.
Hampar, Berge; Zweig, Martin; and Rabin, Harvey, to United States of America, Health and Human Services. Test methods employing monoclonal antibodies against *Herpes simplex* virus types 1 and 2 nucleocapsids proteins. 4,430,437, Cl. 436-548.000.
Hampel, Gerald; and Mugnai, Giorgio, to W. R. Grace & Co., Cryovac Div. Plastic pouch, and storing and dispensing method using same. 4,429,810, Cl. 222-107.000.
Hampton, William E.: *See*—
Harston, John C.; and Hampton, William E., 4,430,147, Cl. 156-578.000.
Hanciulescu, Valentin E.: *See*—
Cucuiat, Iuliu M.; Holdis, Gabriel; and Hanciulescu, Valentin E., 4,429,572, Cl. 73-433.000.
Handa, David H. Spin-casting rod with lure jerking assembly. 4,429,481, Cl. 43-19.200.
Hanna, Khalil, to Sevifra S.A. Surgical apparatus for precisely cutting out the cornea. 4,429,696, Cl. 128-310.000.
Hanna, Marie R.: *See*—
Boden, Richard M.; Tyszkiewicz, Theodore J.; Licciardello, Michael; Vock, Manfred H.; Vinals, Joaquin F.; Whalen, Patrick; and Hanna, Marie R., 4,430,354, Cl. 426-536.000.
Hanna Mining Company, The: *See*—
Rostvold, Virgil C., 4,430,056, Cl. 432-137.000.
Hanrahan, James L.: *See*—
Westdale, Virgil W.; and Hanrahan, James L., 4,430,403, Cl. 430-49.000.
Westdale, Virgil W.; and Hanrahan, James L., 4,430,413, Cl. 430-137.000.
Hansen, Flemming: *See*—
Henrichsen, Frank; Hansen, Flemming; and Sorensen, Kim, 4,430,062, Cl. 433-28.000.
Hanson, Donald N.; and Lynn, Scott, to University of California, The Regents of the. Method of concentrating aqueous solutions. 4,430,227, Cl. 210-642.000.
Hanson, Harry R.: *See*—
Burkhardt, Joseph A.; Childers, Thomas W.; Hanson, Harry R.; and Harkrider, Bobby M., 4,429,620, Cl. 91-395.000.
Hara, Hiroshi: *See*—
Aono, Toshiaki; Hara, Hiroshi; Naito, Hideki; and Sato, Kozo, 4,430,415, Cl. 430-203.000.
Sekine, Jiro; Komatsuzaki, Hiroshi; Hara, Hiroshi; and Kameyama, Nobuyuki, 4,429,976, Cl. 354-203.000.
Sekine, Jiro; Komatsuzaki, Hiroshi; Hara, Hiroshi; and Kameyama, Nobuyuki, 4,429,977, Cl. 354-203.000.
Hara, Toshizo; Sutoh, Shinji; and Kojima, Toshio, to Diesel Kiki Co., Ltd. Apparatus for controlling blowing mode of a car air-conditioner. 4,429,733, Cl. 165-16.000.
Harada, Hidekazu: *See*—
Miyafuji, Motohisa; Matsui, Takashi; Harada, Hidekazu; Soeda, Masumitsu; Ishikawa, Shin; Murakado, Hiroshi; Kawamoto, Hiroaki; Tabuchi, Takeo; Kamada, Kunio; and Nakashima, Yasuhiro, 4,430,298, Cl. 420-481.000.
Harada, Katsuhiro, to Nippon Telegraph & Telephone Public Corporation. Positive resist and method for manufacturing a pattern thereof. 4,430,419, Cl. 430-296.000.
Harada, Kinji: *See*—
Ikeda, Kyoichi; Ando, Motoyoshi; and Harada, Kinji, 4,429,564, Cl. 73-32.00A.
Hardy, John H. M.; Barrett, Robert E.; Allwood, Anthony R.; Riley, Garth I.; Hovell, John; Smith, Donald W.; Potter, Arthur R.; and Lowrie, Ian W., to Post Office. Switching of digital signals. 4,430,733, Cl. 370-110.100.
Hareng, Michel: *See*—
Billard, Jean; Dubois, Jean-Claude; Hareng, Michel; Le Berre, Serge; and Perbet, Jean-Noel, 4,430,650, Cl. 340-784.000.
Harkrider, Bobby M.: *See*—
Burkhardt, Joseph A.; Childers, Thomas W.; Hanson, Harry R.; and Harkrider, Bobby M., 4,429,620, Cl. 91-395.000.
Harney, David E.: *See*—
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Harrel, Incorporated: *See*—
Harris, Holton E., 4,430,698, Cl. 364-162.000.
Harrington, John A., to Minnesota Mining and Manufacturing Company. Data processing form. 4,430,563, Cl. 235-494.000.
Harris, Craig W.: *See*—
Catiller, Robert D.; Harris, Craig W.; and Mathews, Ronald D., 4,430,710, Cl. 364-200.000.
Harris, Dennis J. Container for oil can spout. 4,429,788, Cl. 206-349.000.
Harris Graphics Corporation: *See*—
Hawkes, Richard B., 4,429,795, Cl. 209-651.000.
Harris, Holton E., to Harrel, Incorporated. Three-mode process control. 4,430,698, Cl. 364-162.000.
Harris, James H. Combined uterine injector and manipulative device. 4,430,076, Cl. 604-96.000.
Harris, Rodney G.: *See*—
Kullmann, Donald J.; Karjalainen, William G.; and Harris, Rodney G., 4,429,571, Cl. 73-197.000.
Harsco Corporation: *See*—
D'Alessio, Michael S., 4,430,019, Cl. 403-409.000.
Harston, John C.; and Hampton, William E., to Kliklok Corporation. Hot melt adhesive applicators. 4,430,147, Cl. 156-578.000.
Harte, Kenneth J.: *See*—
Smith, Donald O.; and Harte, Kenneth J., 4,430,571, Cl. 250-492.200.
Hartman, Robert J.: *See*—
Austin, Arthur L.; Levis, William W., Jr.; Pizzini, Louis C.; and Hartman, Robert J., 4,430,247, Cl. 252-182.000.
Hartung, Michael H.: *See*—
Christian, John H.; Hartung, Michael H.; Nolta, Arthur H.; Reed, David G.; Rieck, Richard E.; Tayler, Gerald E.; and Williams, John S., 4,430,701, Cl. 364-200.000.
Harumatsu, Masatoshi: *See*—
Tsushima, Noboru; Tomoyori, Makoto; and Harumatsu, Masatoshi, 4,429,469, Cl. 33-361.000.
Harvel, Ervin R.: *See*—
Blake, Larry W.; Harvel, Ervin R.; Mason, Duane R.; and Wright, George M., 4,429,693, Cl. 604-73.000.
Harvey, Susan L.; Cresswell, James L.; and Huff, B. Jerry L., to Buckeye Cellulose Corporation, The. Monocarboxylic acid antimicrobials in fabrics. 4,430,381, Cl. 428-284.000.
Hascic, Waldemar, to Empex Mineral-Und Naturfaserprodukts AG. Process of manufacture of a composite material and composite material manufactured by this process. 4,430,125, Cl. 106-81.000.
Hasegawa, Kiketsu: *See*—
Noguchi, Yoshiyasu; Yokokoji, Shoji; Saito, Shozo; and Hasegawa, Kiketsu, 4,429,457, Cl. 29-840.000.
Hasegawa, Masami; and Kato, Takashi, to Nissan Motor Co., Ltd. Machining fluid of water soluble type using organic surfactants. 4,430,234, Cl. 252-49.500.
Hashimoto, Michiaki: *See*—
Nakano, Toshio; Taniguchi, Yoshio; Tsutsui, Ken; Sasano, Akira; Kaneko, Tadeo; Izumi, Akiya; and Hashimoto, Michiaki, 4,430,400, Cl. 430-7.000.
Hashizume, Kenichi, to Tokyo Shibaura Denki Kabushiki Kaisha. Method and apparatus for generating vapor. 4,429,662, Cl. 122-32.000.
Hata, Hideo: *See*—
Yoshimura, Isao; Mizukami, Osamu; Hata, Hideo; Kageyama, Junichi; and Kaneko, Takashi, 4,430,377, Cl. 428-213.000.
Yoshimura, Isao; Mizukami, Osamu; Hata, Hideo; Kageyama, Junichi; and Kaneko, Takashi, 4,430,378, Cl. 428-213.000.
Hatschek, Rudolf A., to Asulab AG. Blood pressure measuring equipment. 4,429,699, Cl. 128-681.000.
Hauck, James H.; Nilarp, Anders; and Roach, Thomas J., to International Rectifier Corporation. Process for anodizing surface of gate contact of controlled rectifier having interdigitated gate and emitter contacts. 4,429,453, Cl. 29-591.000.
Hauni-Werke Korber & Co. KG: *See*—
Koch, Franz P.; Helms, Adolf; Siems, Wolfgang; and Brand, Peter, 4,429,567, Cl. 73-49.800.
Hauserman Inc. Int. Furniture & Textile Division: *See*—
Diffrient, Niels, 4,429,917, Cl. 297-300.000.
Hausler, Gerd; Jarisch, Walter; and Makosch, Gunter, to International Business Machines Corporation. Method and device for testing optical imaging systems. 4,429,992, Cl. 356-124.000.
Havas, Jeno: *See*—
Daroczy, Janos; Erdelyi, Janos; Havas, Jeno; Kecskes, Lajos; and Muller, Henrik, 4,430,164, Cl. 204-1.00T.
Hawker Siddeley Canada, Inc.: *See*—
Beattie, Norman W.; and Nyberg, Donald W., 4,430,003, Cl. 366-173.000.
Hawkes, Richard B., to Harris Graphics Corporation. Book reject mechanism. 4,429,795, Cl. 209-651.000.
Hayakawa, Eizi; Kojima, Akio; Arai, Yoshi; Sakuma, Masatoshi; and Toyoshima, Yukichi, to Dainippon Ink & Chemicals Inc.; and Kawamura Institute of Chemical Research. Master plate for dry lithographic printing. 4,430,379, Cl. 428-216.000.
Hayes, Derek. Gripping jaw device for elongated members such as electrical conductors. 4,430,523, Cl. 174-135.000.
Hayes, Donald A.; Finn, Lyle D.; and Brinkmann, Carl R., to Exxon Production Research Co. Rope guiding device. 4,430,023, Cl. 405-224.000.
Hayes, William B., Jr. Battery terminal post seal. 4,430,396, Cl. 429-184.000.
Hebenstreit, Ernst, to Siemens Aktiengesellschaft. Switch with an MIS-FET operated as a source follower. 4,430,586, Cl. 307-570.000.
Heck, Roland H.; Rosinski, Edward J.; and Shih, Stuart S., to Mobil Oil Corporation. Hydrotreating hydrocarbon feedstocks. 4,430,198, Cl. 208-112.000.
Hegde, Ramesh S.; and Ganzi, Gary C., to Millipore Corporation. Method and apparatus for producing ultrapure water. 4,430,226, Cl. 210-638.000.
Heidrich, Gunther: *See*—
Dopfer, Maximilian; and Heidrich, Gunther, 4,429,586, Cl. 74-410.000.

Heine, Diez: *See*—
Alfes, Franz; Perrey, Hermann; Meyer, Karl-Heinrich; Heine, Diez; and Kowitz, Friedrich, 4,430,483, Cl. 525-356.000.

Heinz, Gerhard; Richter, Peter; and Mueller, Wolfgang F., to BASF Aktiengesellschaft. Photopolymerizable mixtures containing elastomeric block polymers and photocurable elements produced therefrom. 4,430,417, Cl. 430-286.000.

Heisig, Ullrich: *See*—
Steinfelder, Karl; Heisig, Ullrich; Schiller, Siegfried; Mehr, Dietrich; Thusse, Bernd; and Hielscher, Klaus, 4,430,687, Cl. 361-293.000.

Heitkamper, Peter; Konig, Klaus; Findeisen, Kurt; Fauss, Rudolf; and Sundermann, Rudolf, to Bayer Aktiengesellschaft. Process for the preparation of N,O-disubstituted urethanes useful for the preparation of isocyanates. 4,430,505, Cl. 560-24.000.

Heller, Andrew R.: *See*—
Cannavino, James A.; Heller, Andrew R.; Taradalsky, Morris; and Worley, William S., Jr., 4,430,705, Cl. 364-200.000.

Helier, Werner H., to UMC Industries, Inc. Planetary speed reducer. 4,429,594, Cl. 74-788.000.

Hellsten, Karl M. E.; and Klingberg, Anders W., to Berol Kemi AB. Esterified dicarboxylic acid and its use. 4,430,238, Cl. 252-61.000.

Heilstrom, Erik I., to Santrade Ltd. Cutting tool. 4,430,031, Cl. 407-104.000.

Helm Instrument Co., Inc.: *See*—
Wilhelm, Donald F., 4,429,579, Cl. 73-768.000.

Helms, Adolf: *See*—
Koch, Franz P.; Helms, Adolf; Siems, Wolfgang; and Brand, Peter, 4,429,567, Cl. 73-49.800.

Hemingway, Trevor; and Middleton, Anthony E., to Davy-Loewy Limited. Crane and manipulator integration. 4,430,041, Cl. 414-787.000.

Henderson, Eugene R. Interlocking building block. 4,429,506, Cl. 52-589.000.

Hendren, Philip A. Implementation system. 4,430,718, Cl. 364-475.000.

Henkel Kommanditgesellschaft auf Aktien: *See*—
Preuss, Wolfgang, 4,430,270, Cl. 260-397.100.
vom Hofe, Dieter; and Meyer, Klaus, 4,430,068, Cl. 493-100.000.

Henrichsen, Frank; Hansen, Flemming; and Sorensen, Kim, to A/S Flex Dental. Dental apparatus with a number of dental instruments connected to a common control circuit and a common operator unit. 4,430,062, Cl. 433-28.000.

Herbert, M. Linton. Wet cornea telescope. 4,429,956, Cl. 350-410.000.

Herberts GmbH: *See*—
Jaeger, Kurt E.; Klein, Klausjorg; Patzschke, Hans-Peter; and Saatweber, Dietrich, 4,430,462, Cl. 523-402.000.

Hermann Berstorff Maschinenbau GmbH: *See*—
Koch, Klaus; and Syrbius, Gerhard, 4,429,628, Cl. 100-117.000.

Hermansdorfer, James E.; and Spurgin, William T., to Sperry Corporation. Step data to synchro converter. 4,430,640, Cl. 340-347.0SY.

Herzog, Earl E., to Quaker Fabric Corp. Method and apparatus for weaving fabrics of novel construction. 4,429,722, Cl. 139-48.000.

Hesston Corporation: *See*—
Lohrentz, Howard R.; and Case, Cecil L., 4,429,517, Cl. 56-181.000.

Hetterich, Hermann: *See*—
Olschewski, Armin; Brandenstein, Manfred; Kunkel, Heinrich; Hetterich, Hermann; Horling, Peter; and Walter, Lothar, 4,429,926, Cl. 308-216.000.

Heusler, Karl; Bickel, Hans; Fechtig, Bruno; Peter, Heinrich; and Scartazzini, Riccardo, to Ciba-Geigy Corporation. 8-Oxo-5-thia-1-azabicyclo(4,2,0)oct-2-ene compounds. 4,430,498, Cl. 544-16.000.

Hewlett-Packard Company: *See*—
Wright, Allen J., 4,430,531, Cl. 200-5.00A.

Heybourne, Robert H.: *See*—
Clements, Herbert A.; and Heybourne, Robert H., 4,429,774, Cl. 192-53.00H.

Hibbel, Josef: *See*—
Schnur, Friedrich; Cornils, Boy; Hibbel, Josef; and Lieder, Bernhard, 4,430,096, Cl. 48-206.000.

Hibino, Yozo: *See*—
Kamejima, Kohji; Hibino, Yozo; Ooizumi, Junichi; Tanaka, Hideki; and Tamura, Morio, 4,429,541, Cl. 62-201.000.

Hidaka, Hiroyosh: *See*—
Hidaka, Hiroyoshi; Matsumoto, Ikuo; Yoshizawa, Junji; and Kotani, Shigenori, 4,430,342, Cl. 424-250.000.

Hidaka, Hiroyoshi; Matsumoto, Ikuo; Yoshizawa, Junji; and Kotani, Shigenori, to Hidaka, Hiroyosh. N-Acyl-3-[4-(benzoylalkyl)piperazin-1-yl]-sydnonimine compound, process for prodction thereof, and use thereof. 4,430,342, Cl. 424-250.000.

Hielscher, Klaus: *See*—
Steinfelder, Karl; Heisig, Ullrich; Schiller, Siegfried; Mehr, Dietrich; Thusse, Bernd; and Hielscher, Klaus, 4,430,687, Cl. 361-293.000.

Hightower, James O.: *See*—
Byrd, James D.; and Hightower, James O., 4,429,634, Cl. 102-290.000.

Higuchi, Hiroshi: *See*—
Takamatsu, Akira; and Higuchi, Hiroshi, 4,430,225, Cl. 210-608.000.

Higuchi, Terumasa; and Susumago, Hiroshi, to Asahi Kasei Kogyo Kabushiki Kaisha. Process for purification of crude acetonitrile. 4,430,162, Cl. 203-37.000.

Hill, James D., Jr; Alexander, David L.; and Brooks, Thomas W., to Dayco Corporation. Apparatus for measuring a belt construction and method of making such apparatus. 4,429,465, Cl. 33-174.00E.

Hill, Lee; and Spector, George, to Hill, Lee. Adjustable wire cutting pliers. 4,429,460, Cl. 30-90.100.

Hill, Nigel; and Rutherford, Dennis F., to Dowty Mining Equipment Limited. Roof support suitable for use in mines. 4,430,026, Cl. 405-291.000.

Hinchcliffe, Dennis, to Molins Limited. Reservoir for rod-like articles. 4,429,779, Cl. 198-347.000.

Hine, Philip: *See*—
Beebe, George W.; Hine, Philip; O'Bryan, Nelson B.; and Shor, Steven M., 4,430,426, Cl. 430-604.000.

Hine, Shiro: *See*—
Yoneda, Masahiro; Hine, Shiro; and Koyama, Hiroshi, 4,430,547, Cl. 219-121.0PD.

Hirai, Hiromu: *See*—
Otsuki, Haruaki; Hirai, Hiromu; and Kawauchi, Masataka, 4,430,606, Cl. 318-601.000.

Hiramoto, Junichi: *See*—
Yoshida, Kenichi; Hiramoto, Junichi; and Takenaka, Shinya, 4,430,610, Cl. 324-51.000.

Hirano, Kichinosuke. Spectacles for giving two-dimentional television or motion pictures three-dimensional appearance. 4,429,951, Cl. 350-144.000.

Hirao, Motoaki: *See*—
Yamazaki, Shigeru; Hirao, Motoaki; Yamagishi, Tatuo; Nagai, Jun; Ooi, Hiroshi; and Shinozaki, Yoshinobu, 4,430,116, Cl. 75-34.000.

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Hisao, Nobuyoshi: *See*—
Aizawa, Tatsuo; Matsumoto, Shoji; Sakata, Kaoru; Matsui, Toshikazu; Fushida, Akira; Ikeda, Toshimitsu; and Hisao, Nobuyoshi, 4,430,410, Cl. 430-122.000.

Hishida, Tadanori; Kuwagaki, Hiroshi; Koyanagi, Katubumi; and Inami, Yasuhiko, to Sharp Kabushiki Kaisha. Manufacture of display electrode layers in electrochromic display devices. 4,430,182, Cl. 204-192.00P.

Hitachi, Ltd.: *See*—
Fukuzawa, Tadashi; Nakamura, Michiharu; and Takahashi, Susumu, 4,430,741, Cl. 372-46.000.
Hosoya, Akira; Tamahashi, Kunihiro; Onuma, Shigeharu; Kakuta, Atsushi; Mori, Yasuki; Suzuki, Katsuhito; and Morishita, Hirosada, 4,430,404, Cl. 430-58.000.
Kamejima, Kohji; Hibino, Yozo; Ooizumi, Junichi; Tanaka, Hideki; and Tamura, Morio, 4,429,541, Cl. 62-201.000.
Kawai, Tadao; and Nakamura, Tomoharu, 4,430,683, Cl. 361-42.000.
Kurosawa, Yukio; Wada, Akira; Iwashita, Kiyoji; and Tsuda, Hideaki, 4,430,536, Cl. 200-144.00B.
Matsunaga, Akira; and Morita, Keiichi, 4,430,664, Cl. 357-73.000.
Murakami, Hiroya; Takasaki, Mitsuhiro; Yamada, Osamu; Kamada, Atsuya; and Hori, Katsuyoshi, 4,429,558, Cl. 72-17.000.
Nakagawa, Nobuo; Kato, Yoshiki; Abe, Katsuo; Edamura, Takao; and Nakamura, Takao, 4,430,387, Cl. 428-579.000.
Nakano, Toshio; Taniguchi, Yoshio; Tsutsui, Ken; Sasano, Akira; Kaneko, Tadeo; Izumi, Akiya; and Hashimoto, Michiaki, 4,430,400, Cl. 430-7.000.
Ogiwara, Kenzu, 4,430,574, Cl. 290-52.000.
Otsuki, Haruaki; Hirai, Hiromu; and Kawauchi, Masataka, 4,430,606, Cl. 318-601.000.
Sato, Isao; Ishibashi, Yohji; Minakawa, Yoshimitsu; Ohmori, Takashi; Tamura, Zensuke; Uchiyama, Yoshihiro; and Ohshima, Ryoichiro, 4,429,538, Cl. 60-748.000.
Shimomoto, Yasuharu; Tsukada, Toshihisa; Sasano, Akira; Tanaka, Yasuo; Yamamoto, Hideaki; and Takasaki, Yukio, 4,430,185, Cl. 204-192.00P.
Suzuki, Keizo; Okudaira, Sadayuki; Nishimatsu, Shigeru; and Kanomata, Ichiro, 4,430,138, Cl. 156-345.000.
Toyooka, Takashi; Aoki, Hirokazu; Sugie, Mamoru; and Yoshizawa, Shigeru, 4,430,729, Cl. 365-6.000.
Yamada, Takahiro; and Kuwabara, Tadashi, 4,430,656, Cl. 346-1.100.
Yanagisawa, Syozo; and Tobita, Yuichi, 4,430,099, Cl. 55-316.000.

Hizume, Akio, to Hoshizaki Electric Co., Ltd. Auger type icemaker. 4,429,551, Cl. 62-354.000.

Ho, Chung W.: *See*—
Chance, Dudley A.; Ho, Chung W.; and Reiley, Timothy C., 4,430,690, Cl. 361-321.000.

Hocking Electronics Limited: *See*—
Calvert, John H., 4,430,615, Cl. 324-239.000.

Hoechst Aktiengesellschaft: *See*—
Ehrl, Winfried; and Jung, Siegfried, 4,430,272, Cl. 260-501.120.
Erpenbach, Heinz; Gehrmann, Klaus; Kubbeler, Hans-Klaus; and Schmitt, Klaus, 4,430,273, Cl. 260-546.000.
Mischke, Peter; Fuchs, Hermann; and Meininger, Fritz, 4,430,259, Cl. 260-186.000.
Pospich, Gunther; and Zimmermann, Wolfgang, 4,430,447, Cl. 521-53.000.
Sorbe, Gunter; Wasel-Nielen, Horst-Dieter; and Kandler, Joachim, 4,430,246, Cl. 252-140.000.

Hoechst-Roussel Pharmaceuticals Inc.: *See*—
Strupczewski, Joseph T.; and Gardner, Beth A., 4,430,335, Cl. 424-267.000.
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Hojaji, Hamid; de Macedo, Pedro B.; and Litovitz, Theodore A., to de Macedo, Pedro Buarque; and Litovitz, Theodore Aaron. Method for making foam glass from diatomaceous earth and fly ash. 4,430,108, Cl. 65-22.000.
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Holland, Gerald F., to Pfizer Inc. Alicyclic substituted oxazolidine-2,4-diones having hypoglycemic activity. 4,430,337, Cl. 424-272.000.
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Holyoak, Hugh K. Apparatus and method of confining fish. 4,429,659, Cl. 119-3.000.
Holzhauser, Dieter, to Kosan Crisplant A/S. Method and apparatus for supplying individual items to a conveyor. 4,429,781, Cl. 198-448.000.
Homeier, Edwin H., to UOP Inc. Alkylation of amine compounds. 4,430,513, Cl. 564-469.000.
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Hon, David T., 4,429,891, Cl. 280-278.000.
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Honda Giken Kogyo Kabushiki Kaisha: *See*—
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Honel, Hans; Michel, Walter; Piesch, Steffen; Schluter, Karin; Seidel, Manfred; and Spieler, Wolfgang, to Cassella Aktiengesellschaft. Bonded structures of textile materials. 4,430,380, Cl. 428-254.000.
Honel, Hans; Michel, Walter; Piesch, Steffen; Schluter, Karin; and Wolf, Alfons, to Cassella Aktiengesellschaft. Melamine resins, a process for their preparation and their use and molding compositions produced from the resins. 4,430,494, Cl. 528-254.000.
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Kelley, John A.; and Michener, Curtis A., 4,430,392, Cl. 429-53.000.
Ritchart, Stuart T., 4,429,705, Cl. 137-65.000.
Honse, James A. Simulated fish skin and fishing lure. 4,429,482, Cl. 43-42.320.
Hoover, Donald P.; Csapo, Michael A.; and Siemssen, Ernst A., to Selas Corporation of America. Calciner screw construction. 4,430,057, Cl. 432-154.000.
Hopkins, Thomas R., to Phillips Petroleum Company. Red absorbing combination of alcohol oxidase and an azide compound. 4,430,427, Cl. 435-25.000.
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Horton, Johnnie A., to Penrod, Leroy, part interest to each. Dual bowl metering block for alcohol and/or nitro-methane burning carburetor and method of conversion. 4,430,275, Cl. 261-18.00B.
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Hosoe, Kazuya; Kinoshita, Takao; and Yamamichi, Masayoshi, to Canon Kabushiki Kaisha. Camera with photoelectric focus detecting device. 4,429,966, Cl. 354-406.000.
Hosoya, Akira; Tamahashi, Kunihiro; Onuma, Shigeharu; Kakuta, Atsushi; Mori, Yasuki; Suzuki, Katsuhito; and Morishita, Hirosada, to Hitachi, Ltd. Electrophotographic photosensitive material having thin amorphous silicon protective layer. 4,430,404, Cl. 430-58.000.
Houck, Timothy B., to Technical and Safety Consultants, Inc. Bucket rotation system for aerial tower. 4,429,763, Cl. 182-2.000.
Hounsel, Mack A.; and Byrd, Carlisle O., Jr., to Manville Service Corporation. Fiber blanket insulation module. 4,429,504, Cl. 52-506.000.
House, Palmer A., to United States of America, Energy. Velocity pump reaction turbine. 4,430,042, Cl. 415-1.000.
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Hruby, Victor J.; and Bregman, Marvin D., to University Patents, Inc. Method of diminishing glucose levels resulting from endogenous glucagon. 4,430,326, Cl. 424-177.000.
Huang, Ming F. Automatic safety gas heating device. 4,429,682, Cl. 126-351.000.
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Hull, John R., to United States of America, Energy. Gradient zone boundary control in salt gradient solar ponds. 4,429,683, Cl. 126-415.000.
Hultquist, John V. Auto body dent removing puller and anchor. 4,429,562, Cl. 72-479.000.
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Hunter, Walter D., to Texaco Development Corp. Process for secondary recovery. 4,430,482, Cl. 525-329.400.
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azole derivatives, process for the preparation thereof and pharmaceutical composition containing the same. 4,430,343, Cl. 424-250.000.
Ihara, Keisuke; Toda, Kazuo; and Hoshino, Shozi, to Tokyo Electric Co., Ltd. Juice extractor device. 4,429,626, Cl. 99-510.000.
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Inoue, Kiyoshi, 4,430,544, Cl. 219-69.00V.
Inoue, Kanji: *See*—
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Inoue, Kiyoshi, to Inoue-Japax Research Incorporated. Laser-activated electrodepositing method and apparatus. 4,430,165, Cl. 204-15.000.
Inoue, Kiyoshi, to Inoue-Japax Research Incorporated. Method of and apparatus for electrodepositing a metal on a substrate. 4,430,167, Cl. 204-25.000.
Inoue, Kiyoshi, to Inoue-Japax Research Incorporated. EDM Machine tool with compounded electrode-reciprocation and servo-feed drivers. 4,430,544, Cl. 219-69.00V.
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Ippen, Jakob; and Stuttgen, Friedel, to Bayer Aktiengesellschaft. Tire having an asymmetrical tread profile. 4,429,728, Cl. 152-209.00A.
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Ito, Keizo: *See*—
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Ito, Takashi, to Fujitsu Limited. Method for forming an aluminum metallic thin film by vapor phase growth on a semiconductor substrate. 4,430,364, Cl. 427-91.000.

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Sakuyama, Masaki; Oishi, Norio; Okamoto, Kouichi; Iwamoto, Masatami; Nomura, Tatsuei; and Nakamura, Shiro, 4,430,589, Cl. 310-52.000.

Iwao, Junichi; Oya, Masayuki; Baba, Toshio; Iso, Tadashi; and Chiba, Takehisa, to Santen Pharmaceutical Co., Ltd. Antihypertensive 4-thiazolidinecarboxylic acids. 4,430,344, Cl. 424-270.000.

Iwashita, Kiyoji: *See*—
Kurosawa, Yukio; Wada, Akira; Iwashita, Kiyoji; and Tsuda, Hideaki, 4,430,536, Cl. 200-144.00B.

Iwata, Toshiharu: *See*—
Utsumi, Hiroo; Sakakibara, Yukio; Ito, Teruyoshi; Iwata, Toshiharu; Ohta, Jun; Kazi, Kiyokane; Hori, Osamu; and Banno, Mitsuyuki, 4,429,565, Cl. 73-35.000.

Izumi, Akiya: *See*—
Nakano, Toshio; Taniguchi, Yoshio; Tsutsui, Ken; Sasano, Akira; Kaneko, Tadeo; Izumi, Akiya; and Hashimoto, Michiaki, 4,430,400, Cl. 430-7.000.

J.F.S., Inc.: *See*—
Johnson, David A., 4,429,479, Cl. 42-6.000.

Jablonski, Henry; and Roughgarden, Jeffrey D., to United States of America, Energy. Spring bypass assembly. 4,429,847, Cl. 248-74.00R.

Jackey, Philip A.; and Canfield, V. Robert, to GAF Corporation. Method of improving the wet tensile strength of glass fiber mats. 4,430,158, Cl. 162-156.000.

Jackson, Dale: *See*—
McManus, John R.; and Jackson, Dale, 4,429,737, Cl. 165-125.000.

Jackson, E. Don; and Myers, Ralph E., to Conmaco, Inc. Control system for pile hammers. 4,429,751, Cl. 173-13.000.

Jackson, Isaac S., to Mallinckrodt, Inc. Inflation valve. 4,429,856, Cl. 251-149.100.

Jackson, Keith L.; Schmitt, Dallas L.; and Schauster, John L., to Lukens General Industries, Inc. Railway vehicle truck. 4,429,637, Cl. 105-168.000.

Jacobs Manufacturing Company, The: *See*—
Jakuba, Stanislav, 4,429,532, Cl. 60-600.000.

Jacobson, Walter E.; and Bliss, Douglas, to Revere Corporation of America. Weighing scale. 4,429,756, Cl. 177-211.000.

Jaeger, Kurt E.; Klein, Klausjorg; Patzschke, Hans-Peter; and Saatweber, Dietrich, to Herberts GmbH. Cathodically depositable aqueous electro-dip lacquer coating composition. 4,430,462, Cl. 523-402.000.

Jagenberg Werke AG: *See*—
Zodrow, Rudolf, 4,430,141, Cl. 156-360.000.

Jakuba, Stanislav, to Jacobs Manufacturing Company, The. Apparatus and method for temporarily converting a turbocharged engine to a compressor. 4,429,532, Cl. 60-600.000.

James, Gordon W.: *See*—
Nadir, Mark; James, Gordon W.; Kuznicki, William J.; and Nieds, Jerome A., 4,430,755, Cl. 455-77.000.

Jandeska, William F., Jr., to General Motors Corporation. Articles produced from iron powder compacts containing hypereutectic copper phosphide powder. 4,430,295, Cl. 419-46.000.

Janome Sewing Machine Industry Co., Ltd.: *See*—
Eguchi, Yasukata; and Shomura, Eiichi, 4,429,649, Cl. 112-229.000.

Jansen, Frans H. J.; and Maroko, Peter R., to Akzo N.V. Method of treatment patients at risk of sudden death. 4,430,338, Cl. 424-274.000.

Japan Spectroscopic Co., Ltd.: *See*—
Watanabe, Mitsuo; Kimura, Shigeyuki; Konishi, Hideki; Tsuji, Yasuhiro; and Wakabayashi, Kiyoshige, 4,429,583, Cl. 73-864.120.

Japax Incorporated: *See*—
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Jarisch, Walter: *See*—
Hausler, Gerd; Jarisch, Walter; and Makosch, Gunter, 4,429,992, Cl. 356-124.000.

Jeco Co., Ltd.: *See*—
Watanabe, Noboru; and Iiyama, Hiroshi, 4,429,470, Cl. 33-395.000.

Jelezov, Jivko Y.; and Bogdanov, Todor D., to DSO "IZOT". Wire feeding mechanism. 4,429,821, Cl. 226-181.000.

Jenkins, Arden F.: *See*—
Alsup, James D., Jr.; Barrett, Kenneth L.; and Jenkins, Arden F., 4,429,918, Cl. 297-353.000.

Jenkins, Robert H., Jr.; and Sweeney, William M., to Texaco Inc. Diesel fuel additive. 4,430,093, Cl. 44-70.000.

Jenkins, Robert L. Pelletized brake lining disc brake. 4,429,767, Cl. 188-71.800.

Jensen, Finn U. H., to Kongskilide Koncernselskab A/S. Angular holder for clamping a harrow tine to a supporting rod. 4,429,436, Cl. 24-3.00D.

Jessamine, Donald W. Water ski tow rope reel apparatus. 4,429,839, Cl. 246-96.000.

Jetter, Milton W. Random multiple push button clock alarm deactivation system. 4,430,006, Cl. 368-73.000.

Jillie, Don W., Jr.; and Smith, Lawrence N., to Sperry Corporation. Superconductive tunnel junction integrated circuit. 4,430,662, Cl. 357-5.000.

Jimenez, Ivan; and Rubin, Irving N. See-through type telescope sight mount for firearms. 4,429,468, Cl. 33-245.000.

John, Gunter; Rainey, James H.; and Valembois, Pierre V., to RCA Corporation. Cutting stylus for mechanically cutting masters for keel-lapping. 4,429,678, Cl. 125-39.000.

Johnson, Arthur .: *See*—
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Johnson, David A., to J.F.S., Inc. Magazine latch release mechanism. 4,429,479, Cl. 42-6.000.

Johnson, Edward R., to GTE Automatic Electric Incorporated. Adaptive IF equalizer for digital transmission. 4,430,744, Cl. 375-14.000.

Johnson, Eric R., to Scandura, Inc. Belt splicing apparatus and method and splice formed thereby. 4,430,146, Cl. 156-502.000.

Johnson, George E.; and Newman, Walter, to Leviton Manufacturing Co., Inc. Threaded lamp adapter. 4,429,942, Cl. 339-154.00L.

Johnson and Johnson: *See*—
Webb, David E.; and Andrews, Lawrence F., 4,430,061, Cl. 433-9.000.

Johnson & Johnson Baby Products Company: *See*—
Repke, Virginia L., 4,430,086, Cl. 604-385.000.

Johnson, Michael K. Control apparatus for selectively recording signals. 4,430,676, Cl. 360-13.000.

Johnston, Otis A.: *See*—
Bedenbender, John W.; Cook, Marvin C.; and Johnston, Otis A., 4,429,898, Cl. 280-678.000.

Jokisch, Friedrich: *See*—
Petrovic, Vladan; Schmid, Karl; Jokisch, Friedrich; and Rotthaus, Heinz, 4,430,161, Cl. 202-228.000.

Jones, Everett E., to Boeing Company, The. Sealant applicator for rivets. 4,429,658, Cl. 118-711.000.

Jones, John L., Sr. Process for increasing the permeability of plastic membrane. 4,430,278, Cl. 264-22.000.

Jones, Mitchel R. Shock responsive rotary actuator. 4,429,704, Cl. 137-45.000.

Jones, Robert L.; and Wilson, Norman H., to National Research Development Corporation. Prostaglandins. 4,430,345, Cl. 424-305.000.

Jones, Ronald L.: *See*—
Haddock, Louis A., Jr.; and Jones, Ronald L., 4,429,761, Cl. 180-271.000.

Jones, Wallace R., to Excello Specialty Company, The. Paint mask and method. 4,430,137, Cl. 156-247.000.

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Joy, John R., to Williams International Corporation. Methanol fueled spark ignition engine. 4,429,534, Cl. 60-618.000.

Joy Manufacturing Company: *See*—
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Jukkola, Glen D.: *See*—
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Junginger, Erich: *See*—
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Junovich, July M.: *See*—
Zhukovsky, Sergei S.; Junovich, July M.; Pertsovsky, Viktor N.; Kolesnikov, Vyacheslav S.; Renzhin, Igor P.; and Rivkin, Semen L., 4,430,441, Cl. 501-109.000.

Kabushiki Kaisha Honda Rukku: *See*—
Onitsuka, Nobuyuki; Fukamachi, Masaaki; and Sueyoshi, Masahiko, 4,430,612, Cl. 324-166.000.
Kabushiki Kaisha Kawai Gakki Seisakusho: *See*—
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Kabushiki Kaisha Kobe Seiko Sho: *See*—
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Kabushiki Kaisha Morita Seisakusho: *See*—
Suzuki, Masakazu; Ikeda, Toshiaki; and Furuichi, Shuhei, 4,430,746, Cl. 378-40.000.
Kabushiki Kaisha Riken: *See*—
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Kabushiki Kaisha Seitai Kagaku Kenkyusho: *See*—
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Kackenmeister, Carl F., to GTE Products Corporation. Tungsten-halogen lamp with free floating getter. 4,430,599, Cl. 313-554.000.
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Robinson, John W.; and Kaganowicz, Grzegorz, 4,430,361, Cl. 427-39.000.
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Kalejs, Juris P.; Chalmers, Bruce; and Surek, Thomas, to Mobil Solar Energy Corporation. Displaced capillary dies. 4,430,305, Cl. 422-246.000.
Kamachi, Shinichi; and Fujiwara, Toshihide, to Olympus Optical Co. Ltd. Process of fractionating electrophoretogram signals. 4,429,996, Cl. 356-344.000.
Kamada, Atsuya: *See*—
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Kaman, Charles H.; and Kaman, C. William, II. Stringed musical instrument top. 4,429,608, Cl. 84-291.000.
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Kamejima, Kohji; Hibino, Yozo; Ooizumi, Junichi; Tanaka, Hideki; and Tamura, Morio, to Hitachi, Ltd. Apparatus for controlling operation of refrigerator. 4,429,541, Cl. 62-201.000.
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Kanada, Takao: *See*—
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Kandell, Ronald J.; Merriam, Donald R.; Root, Bernard H.; and Woodruff, William W., to Stromberg-Carlson Corporation. Telephony system with automatic test call generator for remote port groups. 4,430,530, Cl. 179-175.20D.
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Kaplan, Barbara W., to Union Carbide Corporation. Water soluble pesticidal quaternary ammonium salt compounds. 4,430,341, Cl. 424-250.000.
Kar, Nareshchandra J.; and Nimmagadda, Rao R., to Smith International, Inc. Dual squeeze seal gland. 4,429,854, Cl. 384-94.000.
Karami, Hamzeh, to Colgate-Palmolive Company. Diaper with cushioned elastic leg hold edges. 4,430,088, Cl. 604-385.000.
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Kasday, Leonard R., to Bell Telephone Laboratories, Incorporated. Dictation/transcription method and arrangement. 4,430,726, Cl. 364-900.000.
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Kassai Kabushikikaisha: *See*—
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Kassai, Kenzou, to Kassai Kabushikikaisha. Emergency locking device for safety belt retractor. 4,429,841, Cl. 242-107.40B.
Kato, Masaru, to Mitsubishi Denki Kabushiki Kaisha. Vacuum type breaker contact material of copper infiltrated tungsten. 4,430,124, Cl. 75-248.000.
Kato, So, to Kunishiro Co., Ltd. Reinforced brick assembly. 4,429,499, Cl. 52-228.000.
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Kaufman, Jack W. Disposable swab article. 4,430,013, Cl. 401-132.000.
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Kawasaki, Masahiro; Urano, Fumio; and Tomori, Yasumasa, to Asahi Kogaku Kogyo Kabushiki Kaisha. Compensation for diaphragm control for SLR camera. 4,429,973, Cl. 354-455.000.
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Kellogg, Robert M.; Kruger, Victor R.; and Mulzet, Alfred P., to International Business Machines Corporation. Centrifuge assembly. 4,430,072, Cl. 494-45.000.
Kelvin Lenses Limited: *See*—
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Kerby, Robert C.: *See*—
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Kim, Dongsung R., to Burroughs Corporation. Microprogrammed digital data processing system employing multi-phase subroutine control for concurrently executing tasks. 4,430,707, Cl. 364-200.000.
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King, Don G., to King-Bell Optics, Inc. Panoramic zoom lens assembly. 4,429,957, Cl. 350-423.000.
King Instrument Corporation: *See*—
Berube, Richard G., 4,430,145, Cl. 156-497.000.
Kinnan, Frank, to Electric Power Research Institute, Inc. Underground cable installing apparatus and method utilizing a multi-positionable plow blade. 4,430,022, Cl. 405-183.000.
Kinnebrew, Joseph E., IV. Transit shelter. 4,429,502, Cl. 52-263.000.
Kinoshita, Nobuyasu: *See*—
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Kipp, Michael A., to Container Corporation of America. Leak resistant closure. 4,429,825, Cl. 229-1.50B.
Kirk, Edward W., Jr., to Bell Telephone Laboratories, Incorporated. Tristate transistor logic circuit with reduced power dissipation. 4,430,585, Cl. 307-473.000.
Kirk, Norbert A. Telephone call counter. 4,430,528, Cl. 179-7.00R.
Kiryu, Yuichi. Plasma confining device. 4,430,290, Cl. 376-134.000.
Kishishita, Ryozo: *See*—
Murata, Yoichi; Kishishita, Ryozo; and Nakata, Tadao, 4,429,467, Cl. 33-203.000.
Kitahara, Thuyoshi: *See*—
Sone, Kohki; and Kitahara, Thuyoshi, 4,430,191, Cl. 204-401.000.
Kitahira, Takashi: *See*—
Wada, Toshiaki; Furukawa, Mitsuhiko; Miyahara, Michito; Shiroyama, Masaharu; Misumi, Kiyohito; and Kitahira, Takashi, 4,430,440, Cl. 501-105.000.
Kiuchi, Masashi: *See*—
Tamura, Yasuyuki; Kiuchi, Masashi; Takahashi, Tohru; Mitsuhashi, Yasuo; and Tomari, Seiji, 4,430,411, Cl. 430-122.000.
Kleeb, Thomas R., to Dresser Industries, Inc. Monolithic refractories. 4,430,439, Cl. 501-95.000.
Kleemann, Axel: *See*—
Bethge, Horst; Drauz, Karlheinz; Kleemann, Axel; Martens, Jurgen; and Weigel, Horst, 4,430,509, Cl. 562-401.000.
Klein, John F.: *See*—
Irons, Gary C.; Buzzelli, Dennis K.; Klein, John F.; and Smyth, Richard T., 4,430,546, Cl. 219-121.0PY.
Klein, Klausjorg: *See*—
Jaeger, Kurt E.; Klein, Klausjorg; Patzschke, Hans-Peter; and Saatweber, Dietrich, 4,430,462, Cl. 523-402.000.
Klemm, William A.: *See*—
Sandvig, Robert L.; Klemm, William A.; Gaines, Jack R.; and Looyenga, Robert W., 4,430,240, Cl. 252-70.000.
Klette, Gerd-Rudiger: *See*—
Casper, Clemens; Grenner, Dieter; Klette, Gerd-Rudiger; and Tholema, Edzard, 4,430,156, Cl. 159-47.100.
Kliklok Corporation: *See*—
Harston, John C.; and Hampton, William E., 4,430,147, Cl. 156-578.000.
Kliman, Arthur W.: *See*—
Eldering, Herman G.; and Kliman, Arthur W., 4,430,000, Cl. 356-236.000.
Klingberg, Anders W.: *See*—
Hellsten, Karl M. E.; and Klingberg, Anders W., 4,430,238, Cl. 252-61.000.
Klockner-Humboldt-Deutz Aktiengesellschaft: *See*—
Emundts, Horst; Hoyer, Manfred; and Vogel, Walter, 4,429,588, Cl. 74-484.00R.
Klueting, Bernd A.; and Zaveri, Vikram, to Keiper Recaro, Inc. Composite inertia latch for vehicle seat back. 4,429,919, Cl. 297-379.000.
Klute, Friedrich; and Fender, Robert, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Hydraulic roll-adjustment apparatus. 4,429,618, Cl. 91-1.000.
Knapp, Gordon G.: *See*—
Dubeck, Michael; and Knapp, Gordon G., 4,430,253, Cl. 502-185.000.
Knecht, Fritz. Blade assembly for meat chopper. 4,429,837, Cl. 241-292.100.
Knight, Ronald W.; and Olive, Clive E., to Rolls-Royce Limited. Variable stator vane operating mechanism for turbomachines. 4,430,043, Cl. 415-159.000.
Knoke, Jurgen; Buchwald, Holger; and Fehlhaber, Jurgen, to Carl Freudenberg, Firma. Non-woven fabric with improved hot-press properties and method for manufacturing same. 4,430,372, Cl. 428-90.000.
Knoll, Jozsef; and Nagy, Janos, to Richter Gedeon Vegyeszeti Gyar Rt. Process for the preparation of a selective anorexogenic substance regulating food intake. 4,430,264, Cl. 260-112.00R.
Knorr-Bremse GmbH: *See*—
Saumweber, Eckart; and Schirmer, Klaus, 4,430,703, Cl. 364-426.000.
Kobayashi, Shigeru: *See*—
Yamamura, Yuichi; Ichiro, Azuma; and Kobayashi, Shigeru, 4,430,265, Cl. 260-112.50R.
Kobayashi, Syozo: *See*—
Suzuki, Yukio; and Kobayashi, Syozo, 4,430,538, Cl. 219-10.55F.
Kobayashi, Tatsuhiko: *See*—
Okauchi, Ken; and Kobayashi, Tatsuhiko, 4,430,424, Cl. 430-537.000.
Koch-Ducker, Heinz-Jurgen; Junginger, Erich; and Schnaibel, Eberhard, to Robert Bosch GmbH. Automotive trailer connection recognition system. 4,430,637, Cl. 340-52.00R.
Koch, Franz P.; Helms, Adolf; Siems, Wolfgang; and Brand, Peter, to Hauni-Werke Korber & Co. KG. Apparatus for testing cigarettes or the like. 4,429,567, Cl. 73-49.800.
Koch, Karl-Heinz: *See*—
Omran, Jafar; and Koch, Karl-Heinz, 4,430,194, Cl. 208-8.0LE.
Koch, Klaus; and Syrbius, Gerhard, to Hermann Berstorff Maschinenbau GmbH. Extraction device. 4,429,628, Cl. 100-117.000.
Koellensperger, Paul, to Siemens Aktiengesellschaft. Method and apparatus for automatic recognition of an image pattern, particularly of a line pattern. 4,430,750, Cl. 382-8.000.
Koester, Eberhard: *See*—
Melzer, Milena; Schneider, Norbert; Kopke, Helmut; Schoettle, Klaus; Koester, Eberhard; Balz, Werner; and Grau, Werner, 4,430,362, Cl. 427-48.000.
Kohling, Rolf: *See*—
Ackermann, Manfred; Kohling, Rolf; and Leininger, Dieter, 4,430,126, Cl. 106-97.000.
Koivumaki, Harri; and Sinkkonen, Jouko, to A. Ahlstrom Osakeyhtio. Arrangement for mounting lighting fixtures. 4,430,694, Cl. 362-250.000.
Koizumi, Hideo; Ishihara, Hideo; Matsumoto, Tatsuhiko; and Kawakita, Katsuhiko, to Tokyo Shibaura Denki Kabushiki Kaisha. Molybdenum-based alloy. 4,430,296, Cl. 420-429.000.
Koizumi, Shinichi; Kawaguchi, Takeshi; and Kawasaki, Katsuyoshi, to Honda Giken Kogyo Kabushiki Kaisha. Rear-wheel suspension device for a tricycle vehicle. 4,429,760, Cl. 180-215.000.

Kojima, Akio: *See*—
Hayakawa, Eizi; Kojima, Akio; Arai, Yoshi; Sakuma, Masatoshi; and Toyoshima, Yukichi, 4,430,379, Cl. 428-216.000.

Kojima, Toshio: *See*—
Hara, Toshizo; Sutoh, Shinji; and Kojima, Toshio, 4,429,733, Cl. 165-16.000.

Kolblin, Rolf; Keller, Wolfgang; and Wittmann, Erich. Machine tool. 4,429,443, Cl. 29-26.00A.

Kolesnikov, Vyacheslav S.: *See*—
Zhukovsky, Sergei S.; Junovich, July M.; Pertsovsky, Viktor N.; Kolesnikov, Vyacheslav S.; Reazhin, Igor P.; and Rivkin, Semen I., 4,430,441, Cl. 501-109.000.

Kollmorgen Technologies Corporation: *See*—
Stahl, Fritz; and Steffen, Horst, 4,430,154, Cl. 156-651.000.

Komatsuzaki, Hiroshi: *See*—
Sekine, Jiro; Komatsuzaki, Hiroshi; Hara, Hiroshi; and Kameyama, Nobuyuki, 4,429,976, Cl. 354-203.000.
Sekine, Jiro; Komatsuzaki, Hiroshi; Hara, Hiroshi; and Kameyama, Nobuyuki, 4,429,977, Cl. 354-203.000.

Komiya, Yukiharu: *See*—
Miwa, Tadashi; Kimura, Kiyoshi; Komiya, Yukiharu; and Tarumi, Noriyoshi, 4,430,412, Cl. 430-126.000.

Kondo, Shigeki; Yamazaki, Yoshio; Iketani, Tomofumi; Tanaka, Seiji; and Doi, Keiichiro, to Riccar Co., Ltd.; and Sharp Kabushiki Kaisha. Electromagnetic cooking apparatus. 4,430,542, Cl. 219-10.770.

Kondo, Shinichi: *See*—
Umezawa, Hamao; Takeuchi, Tomio; Kondo, Shinichi; Iinuma, Hironobu; Ikeda, Daishiro; Nakamura, Teruya; and Fujii, Akio, 4,430,346, Cl. 424-311.000.

Kondo, Yoshikazu: *See*—
Watanabe, Tadao; Ohhori, Mitsuo; Ohta, Akio; and Kondo, Yoshikazu, 4,430,386, Cl. 428-555.000.

Kondo, Yukihiro: *See*—
Sauer, Hans; Takada, Takashi; and Kondo, Yukihiro, 4,430,537, Cl. 200-302.100.

Kondziola, Joseph D., to General Motors Corporation. Load transfer system for seat mounted retractor. 4,429,920, Cl. 297-478.000.

Kongskilide Koncernselskab A/S: *See*—
Jensen, Finn U. H., 4,429,436, Cl. 24-3.00D.

Konig, Klaus: *See*—
Heitkamper, Peter; Konig, Klaus; Findeisen, Kurt; Fauss, Rudolf; and Sundermann, Rudolf, 4,430,505, Cl. 560-24.000.

Konishi, Hideki: *See*—
Watanabe, Mitsuo; Kimura, Shigeyuki; Konishi, Hideki; Tsuji, Yasuhiro; and Wakabayashi, Kiyoshige, 4,429,583, Cl. 73-864.120.

Konishiroku Photo Industry Co., Ltd.: *See*—
Abe, Shunichi; and Akiyama, Mitsuo, 4,429,986, Cl. 355-8.000.
Koyama, Mikio; Kikugawa, Shozo; Okaniwa, Kenichiro; and Tamaki, Kiyoshi, 4,430,436, Cl. 436-531.000.
Miwa, Tadashi; Kimura, Kiyoshi; Komiya, Yukiharu; and Tarumi, Noriyoshi, 4,430,412, Cl. 430-126.000.
Okauchi, Ken; and Kobayashi, Tatsuhiko, 4,430,424, Cl. 430-537.000.
Shiozawa, Kazuo; and Sakai, Hideaki, 4,429,975, Cl. 354-202.000.
Tarumi, Noriyoshi; Matsunawa, Masahiko; and Tokunaga, Hiroshi, 4,430,661, Cl. 346-153.100.

Kool-Fire Limited: *See*—
Vandervaart, Gerry, 4,429,734, Cl. 165-29.000.

Kooy, Wayne J.; Krenz, Horst M.; and Unger, Lawrence C., to Zenith Radio Corporation. Paper guide for line printer. 4,430,012, Cl. 400-616.100.

Kopich, Leonard F., to General Motors Corporation. Parking brake actuator mechanism. 4,429,590, Cl. 74-535.000.

Kopke, Helmut: *See*—
Melzer, Milena; Schneider, Norbert; Kopke, Helmut; Schoettle, Klaus; Koester, Eberhard; Balz, Werner; and Grau, Werner, 4,430,362, Cl. 427-48.000.

Kopriva, Vaclav: *See*—
Ferkl, Frantisek; Cap, Antonin; Vecera, Milos; Skala, Josef; Kopriva, Vaclav; Blasko, Michal; Pavek, Karel; Chrtek, Milan; and Blasko, Jan, 4,429,522, Cl. 57-301.000.

Kornerup, Klaus; and Christensen, Per B., to V. Kann Rasmussen Holding A/S. Window, especially for installation in an inclined roof. 4,429,494, Cl. 49-386.000.

Kosan Crisplant A/S: *See*—
Holzhauser, Dieter, 4,429,781, Cl. 198-448.000.

Kostiuk, Alan, deceased: *See*—
Pasquini, Richard J.; Brown, Harold; and Kostiuk, Alan, deceased, 4,430,080, Cl. 604-240.000.

Kostiuk, Barbara, administratrix: *See*—
Pasquini, Richard J.; Brown, Harold; and Kostiuk, Alan, deceased, 4,430,080, Cl. 604-240.000.

Kotani, Shigenori: *See*—
Hidaka, Hiroyoshi; Matsumoto, Ikuo; Yoshizawa, Junji; and Kotani, Shigenori, 4,430,342, Cl. 424-250.000.

Kowitz, Friedrich: *See*—
Alfes, Franz; Perrey, Hermann; Meyer, Karl-Heinrich; Heine, Diez; and Kowitz, Friedrich, 4,430,483, Cl. 525-356.000.

Koyama, Hiroshi: *See*—
Yoneda, Masahiro; Hine, Shiro; and Koyama, Hiroshi, 4,430,547, Cl. 219-121.0PD.

Koyama, Mikio; Kikugawa, Shozo; Okaniwa, Kenichiro; and Tamaki, Kiyoshi, to Konishiroku Photo Industry Co., Ltd. Analytical element and method of use. 4,430,436, Cl. 436-531.000.

Koyanagi, Katubumi: *See*—
Hishida, Tadanori; Kuwagaki, Hiroshi; Koyanagi, Katubumi; and Inami, Yasuhiko, 4,430,182, Cl. 204-192.00P.

Kozischek, James F.; and Martin, M. Donner, Jr., to Armour Pharmaceutical Company. Production of macrospherical particles. 4,430,155, Cl. 159-4.00S.

Kraftwerk Union Aktiengesellschaft: *See*—
Dorner, Heinrich; and Rabe, Gunter, 4,429,663, Cl. 122-365.000.

Krause, Bogdan J., to UOP Inc. Fluidized catalyst regeneration apparatus. 4,430,302, Cl. 422-144.000.

Krauss, Clifford J.: *See*—
Anderson, Harold J. T.; Kerby, Robert C.; Krauss, Clifford J.; and Neame, Hubert W., 4,430,178, Cl. 204-114.000.

Kreher, Alfons; Kuhner, Gerhard; Rothbuhr, Lothar; Turk, Gunter; and Wolff, Siegfried, to Degussa Aktiengesellschaft. Process for the production of mixed granulate from carbon black and light filler. 4,430,280, Cl. 264-117.000.

Krenz, Horst M.: *See*—
Kooy, Wayne J.; Krenz, Horst M.; and Unger, Lawrence C., 4,430,012, Cl. 400-616.100.

Kress, Manfred, to FAG Kugelfischer Georg Schafer & Co. False-twist device. 4,429,524, Cl. 57-336.000.

Kreyss, Gerhard; and Collin, Gerd, to Rutgerswerke Aktiengesellschaft. Process for the electrochemical conversion of coal and use of the reaction products. 4,430,175, Cl. 204-72.000.

Krimphove, Herbert: *See*—
Albers, Manfred; Keunecke, Gerhard; and Krimphove, Herbert, 4,430,163, Cl. 203-75.000.

Krishnan, Sivaram, to Mobay Chemical Corporation. Alkylated aromatic polycarbonate compositions of improved impact strength. 4,430,475, Cl. 525-67.000.

Krist, Otto; Drave, Heinz; and Luypaert, Jozef, to Bayer Aktiengesellschaft. Enamel frit and a process for two-layer and multi-layer one-fire enamelling. 4,430,438, Cl. 501-17.000.

Kroschel, Heinz: *See*—
Dorn, Wolfgang; Ehner, Fritz; Fischer, Klaus; and Kroschel, Heinz, 4,429,635, Cl. 102-401.000.

Kruger, Victor R.: *See*—
Kellogg, Robert M.; Kruger, Victor R.; and Mulzet, Alfred P., 4,430,072, Cl. 494-45.000.

Krupp-Koppers GmbH: *See*—
Petrovic, Vladan; Schmid, Karl; Jokisch, Friedrich; and Rotthaus, Heinz, 4,430,161, Cl. 202-228.000.

Krzycki, Joseph A.: *See*—
Zeikus, Joseph G.; and Krzycki, Joseph A., 4,430,429, Cl. 435-86.000.

Kubbeler, Hans-Klaus: *See*—
Erpenbach, Heinz; Gehrmann, Klaus; Kubbeler, Hans-Klaus; and Schmitt, Klaus, 4,430,273, Cl. 260-546.000.

Kubler, Joseph J.: *See*—
Chadima, George E., Jr.; and Kubler, Joseph J., 4,430,700, Cl. 364-200.000.

Kudlacik, Louis: *See*—
White, Richard T.; and Kudlacik, Louis, 4,429,923, Cl. 308-184.00R.

Kuhlmann, Joachim, to TELEFUNKEN electronic GmbH. Clock generator. 4,430,617, Cl. 328-61.000.

Kuhner, Gerhard: *See*—
Kreher, Alfons; Kuhner, Gerhard; Rothbuhr, Lothar; Turk, Gunter; and Wolff, Siegfried, 4,430,280, Cl. 264-117.000.

Kujas, Erich F., to RCA Corporation. Separator material for alkaline storage cells. 4,430,398, Cl. 429-206.000.

Kukes, Simon G., to Phillips Petroleum Company. Demetallization of hydrocarbon containing feed streams. 4,430,207, Cl. 208-251.00H.

Kullmann, Donald J.; Karjalainen, William G.; and Harris, Rodney G., to Neptune Water Meter Company. Compound liquid flow meter. 4,429,571, Cl. 73-197.000.

Kun, Leslie C., to Union Carbide Corporation. Integral bearing system. 4,430,011, Cl. 384-99.000.

Kuneman, James E.: *See*—
Finn, George A., III; Kuneman, James E.; and Lawrence, Keith E., 4,429,587, Cl. 74-467.000.

Kung, Hank F.: *See*—
Blau, Monte; Kung, Hank F.; and Tramposch, Kenneth M., 4,430,319, Cl. 424-1.100.

Kunimune, Kohichi, to Chisso Corporation. Polypropylene composition. 4,430,477, Cl. 525-70.000.

Kunishiro Co., Ltd.: *See*—
Kato, So, 4,429,499, Cl. 52-228.000.

Kunkel, Heinrich: *See*—
Olschewski, Armin; Brandenstein, Manfred; Kunkel, Heinrich; Hetterich, Hermann; Horling, Peter; and Walter, Lothar, 4,429,926, Cl. 308-216.000.

Kunz, Peter, to Mettler Instrumente AG. Weighing apparatus including a sectional yoke member. 4,429,757, Cl. 177-212.000.

Kupfer, Hanspeter, to Siemens-Albis Aktiengesellschaft. Method and apparatus for suppressing clutter. 4,430,654, Cl. 343-5.0NQ.

Kupper, Wilhelm, to W. Schlafhorst & Co. Central connectible yarn brake mechanism. 4,429,842, Cl. 242-149.000.

Kuraoka, Yasuo: *See*—
Sakao, Nobuo; and Kuraoka, Yasuo, 4,429,542, Cl. 62-62.000.

Kuraray Company, Ltd.: *See*—
Ohyabu, Shuzo; Kawai, Syuji; and Matsumura, Keiji, 4,430,356, Cl. 426-574.000.

Kurosawa, Yukio; Wada, Akira; Iwashita, Kiyoji; and Tsuda, Hideaki, to Hitachi, Ltd. Vacuum interrupter. 4,430,536, Cl. 200-144.00B.

Kuwabara, Tadashi: *See*—
Yamada, Takahiro; and Kuwabara, Tadashi, 4,430,656, Cl. 346-1.100.
Kuwagaki, Hiroshi: *See*—
Hishida, Tadanori; Kuwagaki, Hiroshi; Koyanagi, Katubumi; and Inami, Yasuhiko, 4,430,182, Cl. 204-192.00P.
Kuznicki, William J.: *See*—
Nadir, Mark; James, Gordon W.; Kuznicki, William J.; and Nieds, Jerome A., 4,430,755, Cl. 455-77.000.
Kuzumoto, Hideshi; Tanaka, Tutomu; and Matsumoto, Hiroshi, to Tayo Boseki Kabushiki Kaisha. Hollow fiber package body and its production. 4,430,219, Cl. 210-321.300.
L.C.C.-C.I.C.E. Compagnie Europeenne de Composants Electroniques: *See*—
Lagrange, Alain; and Beauger, Alain, 4,430,689, Cl. 361-321.000.
L. & C. Steinmuller GmbH: *See*—
Feldhoff, Karl; and Peters, Paul, 4,429,664, Cl. 122-376.000.
La Telemecanique Electrique: *See*—
Lefebvre, Marcel; and Ruellan, Daniel, 4,430,684, Cl. 361-98.000.
Lagrange, Alain; and Beauger, Alain, to L.C.C.-C.I.C.E. Compagnie Europeenne de Composants Electroniques. Dielectric ceramic compositions, capacitors in which compositions of this type are employed, and a method of production of said compositions. 4,430,689, Cl. 361-321.000.
Lahoda, Edward J.: *See*—
Pope, James M.; and Lahoda, Edward J., 4,430,257, Cl. 252-629.000.
Laitem, Leopold: *See*—
Broze, Guy; and Laitem, Leopold, 4,430,244, Cl. 252-94.000.
Lalancette, Jean M. Calcined serpentine as inorganic charge in sheet materials. 4,430,157, Cl. 162-145.000.
Lamarche, Paul E., to Borg-Warner Corporation. Series damper rotary and force vector lag control system. 4,430,064, Cl. 464-64.000.
Lamb, John D.; and Chopko, Robert A., to Carrier Corporation. Multiposition electrical connector. 4,429,935, Cl. 339-32.00M.
Lambert, Andre: *See*—
Boudot, Bernard; Nury, Georges; and Lambert, Andre, 4,430,173, Cl. 204-52.00R.
Lancaster, Patrick R., III: *See*—
Lancaster, William G.; and Lancaster, Patrick R., III, 4,429,514, Cl. 53-556.000.
Lancaster, William G.; and Lancaster, Patrick R., III, to Lantech, Inc. Rotatable stretching apparatus with prestretching mechanism. 4,429,514, Cl. 53-556.000.
Langbein-Pfanhauser Werke AG: *See*—
Brugger, Robert; and Schulze-Berge, Klaus, 4,430,172, Cl. 204-43.00N.
Langen, Hans; and Ringel, Helmut, to Kernforschungsanlage Julich GmbH. Operating process for the formation of a steady particle stream of particles conveyed within a flow conduit by a flow medium and arrangement for effectuation of the process. 4,430,030, Cl. 406-146.000.
Langer, Julian: *See*—
Willus, Charles A.; Lewis, Kenneth D.; and Langer, Julian, 4,430,071, Cl. 494-38.000.
Langone, John J., to United States of America, Health and Human Services. Immunoassay utilizing ^{125}I Protein A. 4,430,318, Cl. 424-1.100.
Lantech, Inc.: *See*—
Lancaster, William G.; and Lancaster, Patrick R., III, 4,429,514, Cl. 53-556.000.
La Pierre, Rene B.; and Wong, Stephen S., to Mobil Oil Corporation. Conversion of olefins to low pour point distillates and lubes. 4,430,516, Cl. 585-533.000.
Larsen, Arthur B.: *See*—
Brown, Earl F.; and Larsen, Arthur B., 4,430,526, Cl. 178-18.000.
La Sante, James A., Sr. One way screwdriver. 4,429,599, Cl. 81-436.000.
Laskey, Peter P.: *See*—
Ryan, John J.; and Laskey, Peter P., 4,430,058, Cl. 432-259.000.
Lat, Geronimo E., to United States Gypsum Company. Translucent stainable coating. 4,430,367, Cl. 427-388.400.
Latter, Bruce B., to General Electric Company. Sweep mechanism. 4,429,550, Cl. 62-353.000.
Laughlin, Raymond S.; and Lynch, Edward J., Jr., to Erico Products, Inc. Strut clip. 4,429,440, Cl. 24-486.000.
Launay, Noel, to Societe d'Assistance Technique pour Produits Nestle S.A. Apparatus for sealing tarts or pies. 4,430,053, Cl. 425-510.000.
Lauragri S.A.: *See*—
Gras, Augustin H., 4,430,134, Cl. 156-224.000.
LaVanture, Mark D.; and Walker, George L., to Mobil Oil Corporation. Shipping black phosphoric acid. 4,430,313, Cl. 423-321.00R.
Lawrence, Keith E.: *See*—
Finn, George A., III; Kuneman, James E.; and Lawrence, Keith E., 4,429,587, Cl. 74-467.000.
Layne, Richard C. Cover for refrigerated display cases. 4,429,548, Cl. 62-255.000.
Lazar, Janos J.: *See*—
Taylor, Ottilia Z.; and Lazar, Janos J., 4,429,487, Cl. 46-43.000.
Leach Industries, Inc.: *See*—
Rodgers, Robert E., Jr., 4,429,874, Cl. 273-73.00C.
Leach, James W., to Vought Corporation. Heat exchangers for vuilleumier cycle heat pumps. 4,429,539, Cl. 62-6.000.
Le Berre, Serge: *See*—
Billard, Jean; Dubois, Jean-Claude; Hareng, Michel; Le Berre, Serge; and Perbet, Jean-Noel, 4,430,650, Cl. 340-784.000.
LeBlanc, James S.; and Uke, Alan K., to Paraflexor. Calf stretching device. 4,429,868, Cl. 272-93.000.
LeBlanc, Louis H., Jr.: *See*—
Bailey, Edward A.; and LeBlanc, Louis H., Jr., 4,429,752, Cl. 173-59.000.
Lee, John M.; and Bauman, William C., to Dow Chemical Co., The. Alumina compounds in ion exchange resins. 4,430,311, Cl. 423-179.500.
Lee, Weng Y.; and Sehon, Alec. Penicillin-polyvinyl alcohol conjugate and process of preparation. 4,430,260, Cl. 260-239.100.
Lefebvre, Marcel; and Ruellan, Daniel, to La Telemecanique Electrique. Transistor switching means. 4,430,684, Cl. 361-98.000.
Lefevre, Joseph D.: *See*—
McIntyre, James A.; Phillips, Robert F.; and Lefevre, Joseph D., 4,430,177, Cl. 204-98.000.
Lehmann, Rolf, to Escher Wyss Aktiengesellschaft. Roll for a rolling mill. 4,429,446, Cl. 29-116.0AD.
Leigh Products, Inc.: *See*—
Imhoff, William B., 4,429,492, Cl. 49-367.000.
Leininger, Dieter: *See*—
Ackermann, Manfred; Kohling, Rolf; and Leininger, Dieter, 4,430,126, Cl. 106-97.000.
Leininger, Steven, to Radio Shack. Video processing system. 4,430,649, Cl. 340-731.000.
Lemcke, Ulrich, to Carl-Zeiss-Stiftung. Lamp mounting means. 4,430,696, Cl. 362-306.000.
Lemke, Kenneth W.; and McNeil, Maynard W., to M&T Chemicals Inc. Electroplating baths for nickel, iron, cobalt and alloys thereof. 4,430,171, Cl. 204-43.00T.
Lempert, Joseph: *See*—
Way, Stewart; and Lempert, Joseph, 4,430,588, Cl. 310-11.000.
Lemstra, Pieter J.: *See*—
Smith, Paul; and Lemstra, Pieter J., 4,430,383, Cl. 428-364.000.
Lenk, Erich; and Busch, Hansjochen, to Barmag Barmer Maschinenfabrik AG. Clamping chuck in winding machines. 4,429,838, Cl. 242-46.400.
Leonard, Frank W. Press construction. 4,429,629, Cl. 100-226.000.
Leonard, Wilbur. Layout combination tool. 4,429,466, Cl. 33-180.00R.
Leppard, David G., to Ciba-Geigy AG. Color photographic materials containing stabilizers. 4,430,425, Cl. 430-551.000.
Lesieur-Cotelle & Associes: *See*—
Steiner, Jean-Pierre; Melin, Christiane; Platon, Jean-Francois; and Peton, Nicole, 4,429,859, Cl. 252-8.800.
Lesniewski, Joseph M.; and Breza, Michael J., to Saytech, Inc. Self-extinguishing propylene polymer. 4,430,467, Cl. 524-89.000.
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Freissmuth, Alfred; Gmohling, Werner; and Meichsner, Walter, 4,430,118, Cl. 75-58.000.
Meignast, Didier, to U.S. Philips Corporation. Method of manufacturing field-effect transistors with self-aligned grid and transistors thus obtained. 4,429,452, Cl. 29-571.000.
Meininger, Fritz: *See*—
Mischke, Peter; Fuchs, Hermann; and Meininger, Fritz, 4,430,259, Cl. 260-186.000.
Meisner, Roland; and Buchholz, Hagen, to BASF Farben & Fasern AG. Process and device for delivering a liquid onto a rotating and hollow body. 4,429,833, Cl. 239-224.000.
Meisner, Roland A., to BASF Farben+Fasern AG. Process for coating objects electrostatically. 4,430,359, Cl. 427-31.000.
Melin, Christiane: *See*—
Steiner, Jean-Pierre; Melin, Christiane; Platon, Jean-Francois; and Peton, Nicole, 4,429,859, Cl. 252-8.800.
Melody, David P.; Grant, Seamus M.; and Martin, Francis R., to Loctite Corporation. Two-part composition with activator enriched with dihydropyridine ingredients. 4,430,480, Cl. 525-160.000.
Melzer, Milena; Schneider, Norbert; Kopke, Helmut; Schoettle, Klaus; Koester, Eberhard; Balz, Werner; and Grau, Werner, to BASF Aktiengesellschaft. Production of magnetic recording media. 4,430,362, Cl. 427-48.000.
Memorex Corporation: *See*—
Christensen, Dean L.; and Ebey, Frank S., 4,429,790, Cl. 206-444.000.
Meno, Frank, to University of Pittsburgh. Light beam musical instrument. 4,429,607, Cl. 84-1.180.
Mercier, Jacques H., to Normand Trust, The. Pressure resistant accumulator device. 4,429,718, Cl. 138-30.000.
Merck & Co., Inc.: *See*—
Blair, Lyndia S., 4,430,329, Cl. 424-181.000.
Stoudt, Thomas H.; and Nollstadt, Karl H., 4,430,322, Cl. 424-49.000.
Merck Frosst Canada Inc.: *See*—
Flanagan, Richard J.; and Wiebe, Leonard I., 4,430,321, Cl. 424-1.100.
Merck, James Q.; and Barry, Leon F., to Celotex Corporation, The. Method and apparatus for elutriation of shot from mineral fiber. 4,430,209, Cl. 209-3.000.
Meridian Industries, Inc.: *See*—
Puckett, P. Brooks, Jr., 4,429,789, Cl. 206-370.000.
Merkel, Jurgen: *See*—
Massen, Robert; Merkel, Jurgen; and Lindner, Klaus-Peter, 4,430,722, Cl. 364-728.000.
Merriam, Donald R.: *See*—
Kandell, Ronald J.; Merriam, Donald R.; Root, Bernard H.; and Woodruff, William W., 4,430,530, Cl. 179-175.20D.
Merton, W. Randolph; and Pletcher, Wayne A., to Minnesota Mining and Manufacturing Company. Heat activatable adhesive with improved temperature resistance. 4,430,479, Cl. 525-127.000.
Mertz, Inc.: *See*—
Bedenbender, John W.; Cook, Marvin C.; and Johnston, Otis A., 4,429,898, Cl. 280-678.000.
Mesaros, John G.: *See*—
Mocilac, Joseph P.; Terry, Clifford M.; and Mesaros, John G., 4,429,960, Cl. 351-212.000.
Meshulam, Eli. Motorized cart. 4,429,758, Cl. 180-19.00R.
Metabowerke GmbH & Co.: *See*—
Benzing, Rolf, 4,430,681, Cl. 361-27.000.
Metco, Inc.: *See*—
Irons, Gary C.; Buzzelli, Dennis K.; Klein, John F.; and Smyth, Richard T., 4,430,546, Cl. 219-121.0PY.
Metro, Robert D. Adjustable mechanically cushioned lateral border of the heel for a shoe. 4,429,474, Cl. 36-36.00A.
Mettler Instrumente AG: *See*—
Kunz, Peter, 4,429,757, Cl. 177-212.000.
Metzeler Kautschuk GmbH: *See*—
Frank, Erich; Scheuermann, Walter; and Volk, Georg, 4,429,569, Cl. 73-81.000.
Meurs, Jan H. H.: *See*—
Engels, Rainer; and Meurs, Jan H. H., 4,430,262, Cl. 260-453.00P.
Meyer, Karl-Heinrich: *See*—
Alfes, Franz; Perrey, Hermann; Meyer, Karl-Heinrich; Heine, Diez; and Kowitz, Friedrich, 4,430,483, Cl. 525-356.000.
Meyer, Klaus: *See*—
vom Hofe, Dieter; and Meyer, Klaus, 4,430,068, Cl. 493-100.000.
Meyer, Theodor: *See*—
Burge, Theodor A.; Widmer, Jurg; Meyer, Theodor; and Sulser, Ulrich, 4,430,469, Cl. 524-247.000.
Meyers, Peter: *See*—
Martino, Peter V.; and Meyers, Peter, 4,429,982, Cl. 354-318.000.
Michael, Richard A., to Deere & Company. Full range hydromechanical transmission. 4,429,593, Cl. 74-687.000.
Michael Weinig GmbH & Co. KG: *See*—
Betzler, Otto, 4,429,726, Cl. 144-134.00R.
Michel, Walter: *See*—
Honel, Hans; Michel, Walter; Piesch, Steffen; Schluter, Karin; Seidel, Manfred; and Spieler, Wolfgang, 4,430,380, Cl. 428-254.000.
Honel, Hans; Michel, Walter; Piesch, Steffen; Schluter, Karin; and Wolf, Alfons, 4,430,494, Cl. 528-254.000.
Michener, Curtis A.: *See*—
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Michigan Hanger Company, Inc.: *See*—
Mullenax, Perry D., 4,430,463, Cl. 524-5.000.
Microdot Inc.: *See*—
McKewan, Arthur J., 4,430,033, Cl. 411-61.000.
Micropore International Ltd.: *See*—
McWilliams, Joseph A., 4,430,558, Cl. 219-449.000.
Middleton, Anthony E.: *See*—
Hemingway, Trevor; and Middleton, Anthony E., 4,430,041, Cl. 414-787.000.
Midland-Ross Corporation: *See*—
Flor, Joseph R., 4,429,938, Cl. 339-90.00R.
Miles, Ernest P., Jr. Digital FACSIMILES (Fast Additive Color Separation Internegatives MILES). 4,430,668, Cl. 358-75.000.
Miles, Evelyn A.: *See*—
Malone, Michael J.; and Miles, Evelyn A., 4,430,349, Cl. 426-34.000.
Milleker, William W.; Freeburg, Thomas A.; and Stepien, Michael A., to Motorola, Inc. Data muting method and apparatus for radio communications systems. 4,430,742, Cl. 375-5.000.
Miller Brewing Company: *See*—
Duncombe, George R.; Line, William F.; and Chicoye, Etzer, 4,430,348, Cl. 426-13.000.
Miller, Clare K., to Pako Corporation. Magnetic drive mechanism for film disc processor. 4,429,980, Cl. 354-311.000.
Miller, Jack R., to Eli Lilly and Company. Plant growth regulator compositions and method. 4,430,113, Cl. 71-92.000.
Miller, Norman K. Self-sealing valved bag. 4,430,751, Cl. 383-6.000.
Miller, Norman K. Valved bag with sealing flap. 4,430,752, Cl. 383-6.000.
Millipore Corporation: *See*—
Hegde, Ramesh S.; and Ganzi, Gary C., 4,430,226, Cl. 210-638.000.
Mills, Edwin R.; and Elmore, Ernest L., to Fieldcrest Mills, Inc. Electrical heating apparatus overheat protection circuits. 4,430,560, Cl. 219-505.000.
Minakawa, Yoshimitsu: *See*—
Sato, Isao; Ishibashi, Yohji; Minakawa, Yoshimitsu; Ohmori, Takashi; Tamura, Zensuke; Uchiyama, Yoshihiro; and Ohshima, Ryoichiro, 4,429,538, Cl. 60-748.000.
Minigrip, Inc.: *See*—
Ausnit, Steven, 4,430,070, Cl. 493-215.000.
Minilife A/S: *See*—
Bjornstad, Arne, 4,429,486, Cl. 46-21.000.
Minnesota Mining and Manufacturing Company: *See*—
Beebe, George W.; Hine, Philip; O'Bryan, Nelson B.; and Shor, Steven M., 4,430,426, Cl. 430-604.000.
Crawford, George H.; Downing, Edward J.; and Schlemmer, Roy G., 4,430,366, Cl. 427-162.000.
Daniels, Michael P.; and Schoonover, Robert J., 4,430,363, Cl. 427-54.100.
Freshwater, Lane A.; and Moynagh, Eugene E., 4,429,940, Cl. 339-99.00R.
Harrington, John A., 4,430,563, Cl. 235-494.000.
Maffitt, Kent N.; Robbins, William B.; and Willson, Richard F., 4,430,659, Cl. 346-135.100.
Merton, W. Randolph; and Pletcher, Wayne A., 4,430,479, Cl. 525-127.000.
Roeker, David C., 4,429,455, Cl. 29-749.000.
Sitaramiah, George G., 4,430,408, Cl. 430-106.600.
Swanson, Jerome E., 4,430,414, Cl. 430-176.000.
Thill, Gary A.; and Strand, Jerome E., 4,430,079, Cl. 604-154.000.
Minolta Camera Kabushiki Kaisha: *See*—
Kiba, Akira; and Sugimoto, Kazua, 4,429,984, Cl. 355-3.0SH.
Okada, Osamu, 4,429,865, Cl. 271-170.000.
Yamaguchi, Tamikazu, 4,429,958, Cl. 350-455.000.
Mischenko, Nicholas, to Bell & Howell Company. Slide transfer and shutter control arrangement for slide projector. 4,429,963, Cl. 353-88.000.
Mischke, Peter; Fuchs, Hermann; and Meininger, Fritz, to Hoechst Aktiengesellschaft. Water-soluble disazo compounds suitable as fiber-reactive dyestuffs. 4,430,259, Cl. 260-186.000.

Misselbrook, John G.: *See*—
Armell, Richard A.; and Misselbrook, John G., 4,429,566, Cl. 73-40.700.
Misumi, Kiyohito: *See*—
Wada, Toshiaki; Furukawa, Mitsuhiko; Miyahara, Michito; Shiroyama, Masaharu; Misumi, Kiyohito; and Kitahira, Takashi, 4,430,440, Cl. 501-105.000.
Mita Industrial Co., Ltd.: *See*—
Aizawa, Tatsuo; Matsumoto, Shoji; Sakata, Kaoru; Matsui, Toshikazu; Fushida, Akira; Ikeda, Toshimitsu; and Hisao, Nobuyoshi, 4,430,410, Cl. 430-122.000.
Mitchell, Howard L., III: *See*—
Sawyer, Willard H.; and Mitchell, Howard L., III, 4,430,442, Cl. 502-220.000.
Mitsubishi Denki Kabushiki Kaisha: *See*—
Kato, Masaru, 4,430,124, Cl. 75-248.000.
Namba, Keisuke; Tanaka, Masaaki; Ueno, Takanori; and Tabata, Norikazu, 4,430,306, Cl. 422-292.000.
Nomaguchi, Tamotsu; Tano, Masahiro; Fukuda, Mitsuo; and Saitou, Tatsuo, 4,429,735, Cl. 165-60.000.
Sakuyama, Masaki; Oishi, Norio; Okamoto, Kouichi; Iwamoto, Masatami; Nomura, Tatsuei; and Nakamura, Shiro, 4,430,589, Cl. 310-52.000.
Shiratani, Yuji, 4,430,753, Cl. 455-52.000.
Yoneda, Masahiro; Hine, Shiro; and Koyama, Hiroshi, 4,430,547, Cl. 219-121.0PD.
Yoshida, Osami; Tsuji, Hidekazu; and Nomura, Yoshitada, 4,430,568, Cl. 250-358.100.
Mitsubishi Mining and Cement Company, Ltd.: *See*—
Niwa, Shigeo; Sawai, Kazuhiko; Takahashi, Shinobu; Tagai, Hideo; Ono, Mikiya; Fukuda, Yoshiaki; and Takeuchi, Hiroyasu, 4,429,691, Cl. 128-92.00C.
Mitsueda, Hisami; Tamaki, Kazuyoshi; and Ariyoshi, Hiromi, to Nippondenso Co., Ltd. Input buffer circuit. 4,430,618, Cl. 328-149.000.
Mitsuhashi, Yasuo: *See*—
Tamura, Yasuyuki; Kiuchi, Masashi; Takahashi, Tohru; Mitsuhashi, Yasuo; and Tomari, Seiji, 4,430,411, Cl. 430-122.000.
Mitsui Aluminium Co., Ltd.: *See*—
Tsumura, Yoshishige, 4,430,174, Cl. 204-67.000.
Mitsui Metal Processing Co., Ltd.: *See*—
Aoki, Kiyomi, 4,429,495, Cl. 49-501.000.
Mittleman, Herbert; and Rush, William L., to Baxter Travenol Laboratories, Inc. Injection site with tamper indicator. 4,430,077, Cl. 604-111.000.
Miwa, Tadashi; Kimura, Kiyoshi; Komiya, Yukiharu; and Tarumi, Noriyoshi, to Konishiroku Photo Industry Co., Ltd. Method and apparatus for transferring and fixing toner image using controlled heat. 4,430,412, Cl. 430-126.000.
Miyafuji, Motohisa; Matsui, Takashi; Harada, Hidekazu; Soeda, Masumitsu; Ishikawa, Shin; Murakado, Hiroshi; Kawamoto, Hiroaki; Tabuchi, Takeo; Kamada, Kunio; and Nakashima, Yasuhiro, to Kabushiki Kaisha Kobe Seiko Sho. Copper alloys for electric and electronic devices and method for producing same. 4,430,298, Cl. 420-481.000.
Miyahara, Michito: *See*—
Hagio, Takehiko; and Miyahara, Michito, 4,430,279, Cl. 264-65.000.
Wada, Toshiaki; Furukawa, Mitsuhiko; Miyahara, Michito; Shiroyama, Masaharu; Misumi, Kiyohito; and Kitahira, Takashi, 4,430,440, Cl. 501-105.000.
Miyakawa, Susumu; Fukuta, Toshiaki; Akado, Hajime; and Taki, Yoshihiro, to Nippondenso Co., Ltd. Filter element for filtering fluid and method of producing same. 4,430,223, Cl. 210-493.500.
Miyake, Tetsuya; Takeda, Kunihiko; and Tada, Keishi, to Asahi Kasei Kogyo Kabushiki Kaisha. Novel basic imidazolylmethylstyrene compound, its polymer, a process for the preparation thereof and a use as ion exchange resin. 4,430,445, Cl. 521-38.000.
Miyasaka, Kiyoshi: *See*—
Mogi, Jun-ichi; Miyasaka, Kiyoshi; Enomoto, Seiji; and Nozaki, Shigeki, 4,430,581, Cl. 307-296.00R.
Mizoguchi, Takashi: *See*—
Senda, Masaki; and Mizoguchi, Takashi, 4,430,717, Cl. 364-474.000.
Mizokami, Kazunori, to Olympus Optical Company Ltd. Apparatus for testing automatic electronic flash. 4,429,971, Cl. 354-415.000.
Mizukami, Osamu: *See*—
Yoshimura, Isao; Mizukami, Osamu; Hata, Hideo; Kageyama, Junichi; and Kaneko, Takashi, 4,430,377, Cl. 428-213.000.
Yoshimura, Isao; Mizukami, Osamu; Hata, Hideo; Kageyama, Junichi; and Kaneko, Takashi, 4,430,378, Cl. 428-213.000.
Mizumoto, Kazushige: *See*—
Itoh, Fukusaburo; Mizumoto, Kazushige; and Nishikawa, Yoshikazu, 4,429,863, Cl. 271-9.000.
Mobay Chemical Corporation: *See*—
Krishnan, Sivaram, 4,430,475, Cl. 525-67.000.
Mobil Oil Corporation: *See*—
Audeh, Costandi A.; and Reagan, William J., 4,430,314, Cl. 423-326.000.
Cook, Evin L., 4,429,744, Cl. 166-263.000.
Cook, Evin L., 4,429,745, Cl. 166-263.000.
Fletcher, Argell, 4,430,308, Cl. 423-7.000.
Heck, Roland H.; Rosinski, Edward J.; and Shih, Stuart S., 4,430,198, Cl. 208-112.000.
La Pierre, Rene B.; and Wong, Stephen S., 4,430,516, Cl. 585-533.000.
LaVanture, Mark D.; and Walker, George L., 4,430,313, Cl. 423-321.00R.
Rankel, Lillian A., 4,430,206, Cl. 208-251.00R.
Shihabi, David S., 4,430,200, Cl. 208-120.000.
Mobil Solar Energy Corporation: *See*—
Kalejs, Juris P.; Chalmers, Bruce; and Surek, Thomas, 4,430,305, Cl. 422-246.000.
Mochizuki, Hideaki: *See*—
Tamura, Tooru; Ojima, Nobuyuki; Mochizuki, Hideaki; Souno, Ryuichi; and Ikka, Toshifumi, 4,430,688, Cl. 361-307.000.
Mocilac, Joseph P.; Terry, Clifford M.; and Mesaros, John G. Keratometric device. 4,429,960, Cl. 351-212.000.
Mogi, Jun-ichi; Miyasaka, Kiyoshi; Enomoto, Seiji; and Nozaki, Shigeki, to Fujitsu Limited. Semiconductor substrate bias circuit. 4,430,581, Cl. 307-296.00R.
Mohr, Raphael: *See*—
Goor, Daniel; and Mohr, Raphael, 4,429,701, Cl. 128-713.000.
Mohr, Robert G.: *See*—
VandenHoek, Harold L.; Speet, Larry A.; and Mohr, Robert G., 4,429,934, Cl. 339-22.00R.
Mola, Michel, to Creusot-Loire-Vallourec. Method and apparatus for continuously casting a hollow metal blank, and the resulting blank. 4,430,388, Cl. 428-595.000.
Molins Limited: *See*—
Hinchcliffe, Dennis, 4,429,779, Cl. 198-347.000.
Moller, Heinz, to Robert Bosch GmbH. Monitor for detecting malfunction of a rotation-angle transducer. 4,430,647, Cl. 340-679.000.
Momose, Haruo; Ishida, Masaaki; and Terabe, Mahito, to Ajinomoto Co., Inc. Method for producing L-arginine by fermentation. 4,430,430, Cl. 435-114.000.
Monarch Wine Co., Inc.: *See*—
Zaltsman, Efim, 4,429,799, Cl. 215-31.000.
Monner, Fred M.: *See*—
Friedman, Donald M.; and Monner, Fred M., 4,429,897, Cl. 280-646.000.
Monteil, Andre J. C.: *See*—
Carlier, Patrick; Monteil, Andre J. C.; and Simond, Jacques A. L., 4,430,332, Cl. 424-248.570.
Montgomery, Robert N. Valve for controlling the flow of semi-liquid compositions. 4,429,717, Cl. 137-625.470.
Moore, Brian B.; Rodell, John T.; Sutton, Arthur J.; and Vowell, Jeff D., to International Business Machines Corp. Storage element reconfiguration. 4,430,727, Cl. 364-900.000.
Moore, Ernest C. Disk launching system for games. 4,429,677, Cl. 124-62.000.
Moorfeed Corporation: *See*—
Doty, Myron L., 4,429,808, Cl. 221-167.000.
Mooring, William L., to Douglass, Samuel Ernest. Method for the intravenous administration of plural solutions through a common flow monitoring station. 4,430,074, Cl. 604-49.000.
Moreno, Dawn K.: *See*—
Young, Ainslie T.; Marsters, Robert G.; and Moreno, Dawn K., 4,430,451, Cl. 521-64.000.
Moreno, Robert J.: *See*—
Coulson, Richard L.; Blickenstaff, Ronald L.; Dodd, P. David; Moreno, Robert J.; and Kinard, Dean P., 4,430,712, Cl. 364-300.000.
Morgan, David P., to Portec, Inc. Pedestal container locking device. 4,430,032, Cl. 410-68.000.
Morgan, George W.; and Wetzel, Vernon F., to Suncor, Inc. Means employing hydro-jets for facilitating the clearing of disaggregated ice chunks from the cutting region. 4,429,653, Cl. 114-42.000.
Morgenstern, Karl: *See*—
Neumann, Rainer; Morgenstern, Karl; Lipper, Karl-August; Bruhne, Friedrich; Bockmann, Walter; Casper, Clemens; and Zingel, Siegfried, 4,430,181, Cl. 204-158.0HA.
Mori, Naomichi; Homma, Hiroyuki; Wakabayashi, Masakuni; and Yamaguchi, Masanobu, to Nippon Steel Corporation. Method for submerged-arc welding a very low carbon steel. 4,430,545, Cl. 219-73.000.
Mori, Yasuki: *See*—
Hosoya, Akira; Tamahashi, Kunihiro; Onuma, Shigeharu; Kakuta, Atsushi; Mori, Yasuki; Suzuki, Katsuhito; and Morishita, Hirosada, 4,430,404, Cl. 430-58.000.
Moriizumi, Syuichi: *See*—
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Morishita, Hirosada: *See*—
Hosoya, Akira; Tamahashi, Kunihiro; Onuma, Shigeharu; Kakuta, Atsushi; Mori, Yasuki; Suzuki, Katsuhito; and Morishita, Hirosada, 4,430,404, Cl. 430-58.000.
Morita, Keiichi: *See*—
Matsunaga, Akira; and Morita, Keiichi, 4,430,664, Cl. 357-73.000.
Morris, Philip E., to United States of America, Army. Articulated feeder. 4,429,615, Cl. 89-33.0BB.
Morrone, Joseph A., III, to Adecon, Inc. Key holder. 4,429,557, Cl. 70-456.00R.
Morse, H. Clifton. Coin card and integral information chart therefor. 4,429,787, Cl. 206-83.000.
Moscovici, Anutza: *See*—
Fruchter, Moshe; and Moscovici, Anutza, 4,430,120, Cl. 75-68.00B.
Moscrip, William M. Regenerator structure for stirling-cycle, reciprocating thermal machines. 4,429,732, Cl. 165-10.000.
Mosier, Charles F., Jr.: *See*—
Beitel, James E.; Bruce, Charles R.; Cook, Gary R.; Mosier, Charles F., Jr.; and Sartore, Edward L., 4,430,728, Cl. 364-900.000.
Mosing, Donald E. Pipe thread protector. 4,429,719, Cl. 138-96.00T.

Mosolov, Sergei S.: *See*—
Nemeni, Tibor M.; Nikolsky, Alexandr I.; and Mosolov, Sergei S., 4,430,591, Cl. 310-71.000.
Motorola, Inc.: *See*—
Epsom, Robert L.; Gailus, Paul H.; and van den Heuvel, Anthony P., 4,430,619, Cl. 330-149.000.
Milleker, William W.; Freeburg, Thomas A.; and Stepien, Michael A., 4,430,742, Cl. 375-5.000.
Nadir, Mark; James, Gordon W.; Kuznicki, William J.; and Nieds, Jerome A., 4,430,755, Cl. 455-77.000.
Newton, Anthony D., 4,430,624, Cl. 330-288.000.
Shanley, Charles W., 4,430,596, Cl. 310-348.000.
Motoyama, Katsumi: *See*—
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Moynagh, Eugene E.: *See*—
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MPC Products Corporation: *See*—
Carlson, Richard K., 4,430,632, Cl. 336-120.000.
MSL Industries, Inc.: *See*—
Davis, William L., 4,430,590, Cl. 310-67.00R.
MTU-Motoren- und Turbinen-Union Friedrichshafen GmbH: *See*—
Dinger, Hans, 4,429,533, Cl. 60-606.000.
Mueller, Wolfgang F.: *See*—
Heinz, Gerhard; Richter, Peter; and Mueller, Wolfgang F., 4,430,417, Cl. 430-286.000.
Muellner, William C.: *See*—
Scott, Larkin; and Muellner, William C., 4,430,657, Cl. 346-32.000.
Mugnai, Giorgio: *See*—
Hampel, Gerald; and Mugnai, Giorgio, 4,429,810, Cl. 222-107.000.
Mularie, William M., to Vac-Tec Systems, Inc. Evaporation arc stabilization. 4,430,184, Cl. 204-192.00R.
Mulholland, John H., to 456577 Ontario Limited. Apparatus and method for treating sewage sludge. 4,429,643, Cl. 110-238.000.
Mullenax, Perry D., to Michigan Hanger Company, Inc. Acrylic polymer Portland cement coating composition. 4,430,463, Cl. 524-5.000.
Muller, Henrik: *See*—
Daroczy, Janos; Erdelyi, Janos; Havas, Jeno; Kecskes, Lajos; and Muller, Henrik, 4,430,164, Cl. 204-1.00T.
Muller, Jacques, to ETA S.A. Fabriques d'Ebauches. Arrangement for securing and electrically contacting a battery in a watch. 4,430,009, Cl. 368-203.000.
Muller, Rolf. Brushless direct current motor having a once-around pulse generating means. 4,430,603, Cl. 318-254.000.
Multikey Ltd.: *See*—
Salsbury, Michael A., 4,429,555, Cl. 70-366.000.
Mulzet, Alfred P.: *See*—
Kellogg, Robert M.; Kruger, Victor R.; and Mulzet, Alfred P., 4,430,072, Cl. 494-45.000.
Murakado, Hiroshi: *See*—
Miyafuji, Motohisa; Matsui, Takashi; Harada, Hidekazu; Soeda, Masumitsu; Ishikawa, Shin; Murakado, Hiroshi; Kawamoto, Hiroaki; Tabuchi, Takeo; Kamada, Kunio; and Nakashima, Yasuhiro, 4,430,298, Cl. 420-481.000.
Murakami, Hideaki. Automatic rat killing device. 4,429,483, Cl. 43-70.000.
Murakami, Hiroya; Takasaki, Mitsuhiro; Yamada, Osamu; Kamada, Atsuya; and Hori, Katsuyoshi, to Hitachi, Ltd. Method of and apparatus for fabrication of spiral fin. 4,429,558, Cl. 72-17.000.
Murata Manufacturing Co., Ltd.: *See*—
Nakagawa, Nobuhiko; and Yoshii, Tsutomu, 4,430,529, Cl. 179-110.00A.
Murata, Yoichi; Kishishita, Ryozo; and Nakata, Tadao, to Toyota Jidosha Kogyo Kabushiki Kaisha. Apparatus for measuring toe-in of a motor vehicle wheel. 4,429,467, Cl. 33-203.000.
Murdock, Keith C.; and Durr, Frederick E., to American Cyanamid Company. 1,4-Bis(substituted-amino)-5,8-dihydroxy-anthraquinones and leuco bases thereof. 4,430,501, Cl. 544-72.000.
Murray, Alexander P.: *See*—
Spurrier, Francis R.; DeZubay, Egon A.; Murray, Alexander P.; and Vidt, Edward J., 4,430,304, Cl. 422-204.000.
Murray, Myles N. Document mailer and postal system. 4,429,827, Cl. 229-68.00R.
Muth, Wolfgang. Circuit arrangement. 4,430,607, Cl. 323-217.000.
Myers, Ralph E.: *See*—
Jackson, E. Don; and Myers, Ralph E., 4,429,751, Cl. 173-13.000.
Nadir, Mark; James, Gordon W.; Kuznicki, William J.; and Nieds, Jerome A., to Motorola, Inc. Portable radio telephone. 4,430,755, Cl. 455-77.000.
Nagai, Jun: *See*—
Yamazaki, Shigeru; Hirao, Motoaki; Yamagishi, Tatuo; Nagai, Jun; Ooi, Hiroshi; and Shinozaki, Yoshinobu, 4,430,116, Cl. 75-34.000.
Nagao, Nobuya: *See*—
Taguchi, Shinichiro; Nagao, Nobuya; and Ogihara, Yutaka, 4,430,674, Cl. 358-317.000.
Nagy, Janos: *See*—
Knoll, Jozsef; and Nagy, Janos, 4,430,264, Cl. 260-112.00R.
Naito, Hideki: *See*—
Aono, Toshiaki; Hara, Hiroshi; Naito, Hideki; and Sato, Kozo, 4,430,415, Cl. 430-203.000.
Nakagawa, Kumaichi; and Inaga, Hisashi, to Kioritz Corporation. Internal combustion engine for portable machine. 4,429,668, Cl. 123-56.00B.
Nakagawa, Masao: *See*—
Senda, Kenichi; and Nakagawa, Masao, 4,430,450, Cl. 521-60.000.
Nakagawa, Nobuhiko; and Yoshii, Tsutomu, to Murata Manufacturing Co., Ltd. Piezoelectric loudspeaker. 4,430,529, Cl. 179-110.00A.
Nakagawa, Nobuo; Kato, Yoshiki; Abe, Katsuo; Edamura, Takao; and Nakamura, Takao, to Hitachi, Ltd. Base plate for magnetic recording disc. 4,430,387, Cl. 428-579.000.
Nakajima, Takashi; and Matsui, Fujio, to Denki Kagaku Kogyo Kabushiki Kaisha. Protecting tube for thermocouple. 4,430,518, Cl. 136-234.000.
Nakamura, Michiharu: *See*—
Fukuzawa, Tadashi; Nakamura, Michiharu; and Takahashi, Susumu, 4,430,741, Cl. 372-46.000.
Nakamura, Shiro: *See*—
Sakuyama, Masaki; Oishi, Norio; Okamoto, Kouichi; Iwamoto, Masatami; Nomura, Tatsuei; and Nakamura, Shiro, 4,430,589, Cl. 310-52.000.
Nakamura, Takao: *See*—
Nakagawa, Nobuo; Kato, Yoshiki; Abe, Katsuo; Edamura, Takao; and Nakamura, Takao, 4,430,387, Cl. 428-579.000.
Nakamura, Teruya: *See*—
Umezawa, Hamao; Takeuchi, Tomio; Kondo, Shinichi; Iinuma, Hironobu; Ikeda, Daishiro; Nakamura, Teruya; and Fujii, Akio, 4,430,346, Cl. 424-311.000.
Nakamura, Tomoharu: *See*—
Kawai, Tadao; and Nakamura, Tomoharu, 4,430,683, Cl. 361-42.000.
Nakanishi, Keiichi, to Nissan Motor Co., Ltd. Labyrinth seal construction. 4,429,883, Cl. 277-53.000.
Nakano, Toshio; Taniguchi, Yoshio; Tsutsui, Ken; Sasano, Akira; Kaneko, Tadeo; Izumi, Akiya; and Hashimoto, Michiaki, to Hitachi, Ltd. Method of producing color filters using dehydrating solution. 4,430,400, Cl. 430-7.000.
Nakashima, Yasuhiro: *See*—
Miyafuji, Motohisa; Matsui, Takashi; Harada, Hidekazu; Soeda, Masumitsu; Ishikawa, Shin; Murakado, Hiroshi; Kawamoto, Hiroaki; Tabuchi, Takeo; Kamada, Kunio; and Nakashima, Yasuhiro, 4,430,298, Cl. 420-481.000.
Nakasone, Hiroyuki; and Sakamoto, Takayasu, to Toko Kabushiki Kaisha. Piezo-electric push button switch. 4,430,595, Cl. 310-339.000.
Nakata, Tadao: *See*—
Murata, Yoichi; Kishishita, Ryozo; and Nakata, Tadao, 4,429,467, Cl. 33-203.000.
Nakatani, Hiroshi; Ishida, Masahide; and Yamamoto, Hachizou, to Sharp Kabushiki Kaisha. PLU-Code controlled electronic cash register. 4,430,713, Cl. 364-405.000.
Nakatsui, Hisashi; and Hajimoto, Yoshioki, to Canon Kabushiki Kaisha. Photoelectric converting device. 4,430,666, Cl. 358-44.000.
Nakayama, Takashi: *See*—
Kajita, Koji; Nakayama, Takashi; and Yamagata, Seiichi, 4,429,523, Cl. 57-328.000.
Nalco Chemical Company: *See*—
Payne, Charles C., 4,430,369, Cl. 427-397.700.
Namba, Keisuke; Tanaka, Masaaki; Ueno, Takanori; and Tabata, Norikazu, to Mitsubishi Denki Kabushiki Kaisha. Oxygen recycle type ozonizing apparatus. 4,430,306, Cl. 422-292.000.
Nappholz, Tibor A.; Bradbury, Ronald C.; and Satchwell, Bruce R., to Telectronics Pty. Ltd. Dual chamber heart pacer with improved ventricular rate control. 4,429,697, Cl. 128-419.0PG.
Narducy, Kenneth W.: *See*—
Raden, Daniel S.; Carlsen, Russell O.; and Narducy, Kenneth W., 4,430,455, Cl. 521-118.000.
National Research Development Corporation: *See*—
Goulas, Apostolos, 4,429,995, Cl. 356-343.000.
Jones, Robert L.; and Wilson, Norman H., 4,430,345, Cl. 424-305.000.
National Semiconductor Corporation: *See*—
Bose, Bidyut K.; and Jorgensen, John M., 4,430,582, Cl. 307-297.000.
Wieser, James B.; and Patel, Suman H., 4,430,621, Cl. 330-9.000.
Neame, Hubert W.: *See*—
Anderson, Harold J. T.; Kerby, Robert C.; Krauss, Clifford J.; and Neame, Hubert W., 4,430,178, Cl. 204-114.000.
Neitzke, Thomas G.: *See*—
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Neki, Shigeo: *See*—
Dohi, Takashi; Shinozaki, Nozomu; and Neki, Shigeo, 4,429,773, Cl. 192-18.00B.
Nelms, Robert L., to Allfarr Enterprises, Inc. Farrier's equine hoof-sizer. 4,429,749, Cl. 168-45.000.
Nelson, Norman A., to Upjohn Company, The. Pyridinyl substituted benzimidazoles and quinoxalines. 4,430,502, Cl. 544-354.000.
Nelson, Robert H., to R. H. Nelson Holdings Ltd. Cooking sheet and lifter for poultry, meat and the like. 4,429,625, Cl. 99-425.000.
Nemeni, Tibor M.; Nikolsky, Alexandr I.; and Mosolov, Sergei S. Stator coil of a high-voltage generator. 4,430,591, Cl. 310-71.000.
Neptune Water Meter Company: *See*—
Kullmann, Donald J.; Karjalainen, William G.; and Harris, Rodney G., 4,429,571, Cl. 73-197.000.
Nerlinger, John J., to Mead Corporation. Fastening means for making inserts in wire bound notebooks and the like. 4,430,015, Cl. 402-79.000.
Nesler, John J., to Hughes Aircraft Company. Base drive circuit. 4,430,608, Cl. 323-282.000.
Nestor, Charles R., to General Motors Corporation. Terminal for baseless cartridge lamp sockets. 4,429,945, Cl. 339-252.00R.

Netravali, Arun N., to Bell Telephone Laboratories, Incorporated. Reconstruction of quantized DPCM or PCM signals. 4,430,670, Cl. 358-135.000.

Neumann, Rainer; Morgenstern, Karl; Lipper, Karl-August; Bruhne, Friedrich; Bockmann, Walter; Casper, Clemens; and Zingel, Siegfried, to Bayer Aktiengesellschaft. Process for the preparation of benzoyl chloride. 4,430,181, Cl. 204-158.0HA.

Nevamar Corporation: *See*—
Scher, Herbert I.; and Ungar, Israel S., 4,430,375, Cl. 428-148.000.

New England Instrument Company: *See*—
Sacchetti, Peter J., 4,430,635, Cl. 338-176.000.

Newkirk, James S.; and Wiederhold, Robert A., to Eastman Kodak Company. Fuser member. 4,430,406, Cl. 430-99.000.

Newman, Walter: *See*—
Johnson, George E.; and Newman, Walter, 4,429,942, Cl. 339-154.00L.

Newton, Anthony D., to Motorola, Inc. Current mirror circuit arrangement. 4,430,624, Cl. 330-288.000.

Ngo, Peter D. T.: *See*—
Boyd, Gary D.; and Ngo, Peter D. T., 4,430,601, Cl. 315-169.400.

NHK Spring Co., Ltd.: *See*—
Ohno, Akira; Sato, Toshiaki; and Inoue, Kanji, 4,429,899, Cl. 280-689.000.

Nibco Inc.: *See*—
Runyan, Gary L.; and Sloan, Paul H., Jr., 4,430,285, Cl. 264-242.000.

Nichias Corporation: *See*—
Shima, Shigeru, 4,430,121, Cl. 75-96.000.

Niedecker, Herbert. Apparatus for positioning a workpiece. 4,429,862, Cl. 269-47.000.

Nieds, Jerome A.: *See*—
Nadir, Mark; James, Gordon W.; Kuznicki, William J.; and Nieds, Jerome A., 4,430,755, Cl. 455-77.000.

Nightingale Saro Inc.: *See*—
Blouin, Joseph L. D. C., 4,429,930, Cl. 312-216.000.

Nihon Eikan Shido Center Co., Ltd.: *See*—
Furuya, Mitsumasa, 4,430,054, Cl. 431-4.000.

Nikolsky, Alexandr I.: *See*—
Nemeni, Tibor M.; Nikolsky, Alexandr I.; and Mosolov, Sergei S., 4,430,591, Cl. 310-71.000.

Nilarp, Anders: *See*—
Hauck, James H.; Nilarp, Anders; and Roach, Thomas J., 4,429,453, Cl. 29-591.000.

Nilssen, Ole K. High efficiency inverter and ballast circuits. 4,430,628, Cl. 331-113.00A.

Nilsson, Jan-Erik: *See*—
Pupp, Herwig; Andersson, Otto B.; and Nilsson, Jan-Erik, 4,430,140, Cl. 156-356.000.

Nimmagadda, Rao R.: *See*—
Kar, Nareshchandra J.; and Nimmagadda, Rao R., 4,429,854, Cl. 384-94.000.

Nippon Chemtec Consulting Inc.: *See*—
Satake, Takeo, 4,430,230, Cl. 210-691.000.

Nippon Electric Co., Ltd.: *See*—
Okada, Toshio; Motoyama, Katsumi; and Yoshii, Takashi, 4,430,598, Cl. 313-497.000.
Saga, Ryokichi; and Takimoto, Yukio, 4,430,732, Cl. 370-54.000.
Watanabe, Kojiro, 4,430,743, Cl. 375-13.000.

Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Aoki, Eiichiro, 4,429,606, Cl. 84-1.170.
Yokoyama, Kenji, 4,430,625, Cl. 330-297.000.

Nippon Kogaku K. K.: *See*—
Saegusa, Takashi, 4,429,969, Cl. 354-414.000.

Nippon Steel Corporation: *See*—
Mori, Naomichi; Homma, Hiroyuki; Wakabayashi, Masakuni; and Yamaguchi, Masanobu, 4,430,545, Cl. 219-73.000.

Nippon Telegraph & Telephone Public Corporation: *See*—
Harada, Katsuhiro, 4,430,419, Cl. 430-296.000.

Nippon Tungsten Co., Ltd.: *See*—
Hagio, Takehiko; and Miyahara, Michito, 4,430,279, Cl. 264-65.000.
Wada, Toshiaki; Furukawa, Mitsuhiko; Miyahara, Michito; Shiroyama, Masaharu; Misumi, Kiyohito; and Kitahira, Takashi, 4,430,440, Cl. 501-105.000.

Nippon Unicar Company Ltd.: *See*—
Taniguchi, Seiho; Sakuma, Yuichiro; and Yoshii, Tadashi, 4,430,470, Cl. 524-269.000.

Nippondenso Co., Ltd.: *See*—
Mitsueda, Hisami; Tamaki, Kazuyoshi; and Ariyoshi, Hiromi, 4,430,618, Cl. 328-149.000.
Miyakawa, Susumu; Fukuta, Toshiaki; Akado, Hajime; and Taki, Yoshihiro, 4,430,223, Cl. 210-493.500.
Utsumi, Hiroo; Sakakibara, Yukio; Ito, Teruyoshi; Iwata, Toshiharu; Ohta, Jun; Kazi, Kiyokane; Hori, Osamu; and Banno, Mitsuyuki, 4,429,565, Cl. 73-35.000.

Nishikawa, Yoshikazu: *See*—
Itoh, Fukusaburo; Mizumoto, Kazushige; and Nishikawa, Yoshikazu, 4,429,863, Cl. 271-9.000.

Nishikubo, Yasuhiko, to Citizen Watch Co., Ltd. Quartz oscillation-type electronic timepiece. 4,430,008, Cl. 368-202.000.

Nishimatsu, Shigeru: *See*—
Suzuki, Keizo; Okudaira, Sadayuki; Nishimatsu, Shigeru; and Kanomata, Ichiro, 4,430,138, Cl. 156-345.000.

Nishimura, Kosuke, to Sharp Kabushiki Kaisha. Speech synthesizer timepiece with alarm function. 4,430,005, Cl. 368-67.000.

Nishiyama, Hissai; and Kanada, Takao, to Yoshida Kogyo K. K. Method and apparatus for manufacturing a hooked fastener part for hook-and-loop fasteners. 4,429,441, Cl. 26-9.000.

Niskanen, Erkki J. Cascade-based method and device for fluid handling and measurement. 4,429,709, Cl. 137-220.000.

Nissan Motor Co., Ltd.: *See*—
Hasegawa, Masami; and Kato, Takashi, 4,430,234, Cl. 252-49.500.
Kawamura, Yoshihisa, 4,429,667, Cl. 123-52.00M.
Matsuda, Toshiro; and Honda, Minoru, 4,430,714, Cl. 364-426.000.
Nakanishi, Keiichi, 4,429,883, Cl. 277-53.000.
Sone, Kohki; and Kitahara, Thuyoshi, 4,430,191, Cl. 204-401.000.
Suzuki, Mikio; and Yamazaki, Masafumi, 4,430,274, Cl. 261-18.00B.

Nitschke, Noel N. Multi-faced clock. 4,430,004, Cl. 368-235.000.

Niu, Joseph H. Y., to Betz Laboratories, Inc. Method and composition for neutralizing acidic components in petroleum refining units. 4,430,196, Cl. 208-47.000.

Niwa, Shigeo; Sawai, Kazuhiko; Takahashi, Shinobu; Tagai, Hideo; Ono, Mikiya; Fukuda, Yoshiaki; and Takeuchi, Hiroyasu, to Mitsubishi Mining and Cement Company, Ltd. Method for filling in defects or hollow portions of bones. 4,429,691, Cl. 128-92.00C.

Nixdorf Computer AG: *See*—
Burchart, Joachim, 4,429,639, Cl. 109-19.000.

Noguchi, Yoshiyasu; Yokokoji, Shoji; Saito, Shozo; and Hasegawa, Kiketsu, to Toppan Printing Co., Ltd. Process for manufacturing a printed circuit board. 4,429,457, Cl. 29-840.000.

Nollstadt, Karl H.: *See*—
Stoudt, Thomas H.; and Nollstadt, Karl H., 4,430,322, Cl. 424-49.000.

Nolta, Arthur H.: *See*—
Christian, John H.; Hartung, Michael H.; Nolta, Arthur H.; Reed, David G.; Rieck, Richard E.; Tayler, Gerald E.; and Williams, John S., 4,430,701, Cl. 364-200.000.

Nomaguchi, Tamotsu; Tano, Masahiro; Fukuda, Mitsuo; and Saitou, Tatsuo, to Mitsubishi Denki Kabushiki Kaisha. Simplified air conditioner. 4,429,735, Cl. 165-60.000.

Nomura, Masayuki: *See*—
Saito, Hideomi; Yamamoto, Tomoya; Nomura, Masayuki; and Hachiya, Tomoyoshi, 4,430,500, Cl. 544-25.000.

Nomura, Tatsuei: *See*—
Sakuyama, Masaki; Oishi, Norio; Okamoto, Kouichi; Iwamoto, Masatami; Nomura, Tatsuei; and Nakamura, Shiro, 4,430,589, Cl. 310-52.000.

Nomura, Yoshitada: *See*—
Yoshida, Osami; Tsuji, Hidekazu; and Nomura, Yoshitada, 4,430,568, Cl. 250-358.100.

Norand Corporation: *See*—
Chadima, George E., Jr.; and Kubler, Joseph J., 4,430,700, Cl. 364-200.000.

Normand Trust, The: *See*—
Mercier, Jacques H., 4,429,718, Cl. 138-30.000.

Norris, James R., to Dapco Industries, Inc. Ultrasonic inspection apparatus. 4,429,576, Cl. 73-636.000.

Northern Telecom Limited: *See*—
Garner, John N.; Roberge, Jean M.; and Axiuk, Oleg, 4,429,519, Cl. 57-293.000.
Garner, John N.; and Roberge, Jean M., 4,429,520, Cl. 57-293.000.

Nose, Takashi: *See*—
Iemura, Ryuichi; Kawashima, Tsuneo; Fukuda, Toshikazu; Ito, Keizo; Nose, Takashi; and Tsukamoto, Goro, 4,430,343, Cl. 424-250.000.

Noster Industries, Inc.: *See*—
Cushman, Richard, 4,429,753, Cl. 173-149.000.

Nozaki, Shigeki: *See*—
Mogi, Jun-ichi; Miyasaka, Kiyoshi; Enomoto, Seiji; and Nozaki, Shigeki, 4,430,581, Cl. 307-296.00R.

Nozawa, Reikichi. Liquefied natural gas-refrigerant electricity generating system. 4,429,536, Cl. 60-655.000.

Nury, Georges: *See*—
Boudot, Bernard; Nury, Georges; and Lambert, Andre, 4,430,173, Cl. 204-52.00R.

Nussbaumer, Dietmar: *See*—
Perl, Horst; Nussbaumer, Dietmar; Schmidt, Hans-Weddo; Pradel, Gunter; and Grummert, Ulrich, 4,430,218, Cl. 210-321.300.

Nuyen, Trong L.; and de Cremoux, Baudouin, to Thomson-CSF. Long-wavelength semiconductor laser. 4,430,740, Cl. 372-45.000.

Nyberg, Donald W.: *See*—
Beattie, Norman W.; and Nyberg, Donald W., 4,430,003, Cl. 366-173.000.

O'Bryan, Nelson B.: *See*—
Beebe, George W.; Hine, Philip; O'Bryan, Nelson B.; and Shor, Steven M., 4,430,426, Cl. 430-604.000.

Occidental Chemical Corporation: *See*—
Davison, John B., 4,430,176, Cl. 204-84.000.

Ocean & Atmospheric Science, Inc.: *See*—
Steinberg, Alfred, 4,429,545, Cl. 62-235.100.

Ochi, Takashi; and Kaneko, Fumihiko, to Sumitomo Bakelite Company. Apparatus for attaching a bottom plate made of a plastic material to one end of an open ended, hollow cylinder made of a plastic material. 4,430,142, Cl. 156-379.900.

Oestreich, Ulrich, to Siemens Aktiengesellschaft. Device for SZ-stranding by using a tube store. 4,429,521, Cl. 57-294.000.

Ofield, L. Ronald; Puurits, Leonhard; and Patterson, Roy A., to Westcan Electrical Manufacturing Inc. Optional rear entry back connector for a baseboard heater. 4,430,521, Cl. 174-65.00R.

Ogata, Masaru, to Shionogi & Co., Ltd. Antiarrhytmic benzylimidazole. 4,430,331, Cl. 424-273.00R.

Ogawa, Masahiko: *See*—
Tokuda, Ryuji; Ogawa, Masahiko; Tsunekawa, Tokuichi; and Tamura, Shuichi, 4,429,967, Cl. 354-403.000.

Ogihara, Yutaka: *See*—
Taguchi, Shinichiro; Nagao, Nobuya; and Ogihara, Yutaka, 4,430,674, Cl. 358-317.000.

Ogiwara, Kenzu, to Hitachi, Ltd. Method for switching operation of water wheel or pump water wheel. 4,430,574, Cl. 290-52.000.

Ohhori, Mitsuo: *See*—
Watanabe, Tadao; Ohhori, Mitsuo; Ohta, Akio; and Kondo, Yoshikazu, 4,430,386, Cl. 428-555.000.

Ohmori, Kouichi, to Canon Kabushiki Kaisha. Electronic flash device. 4,430,602, Cl. 315-241.00P.

Ohmori, Takashi: *See*—
Sato, Isao; Ishibashi, Yohji; Minakawa, Yoshimitsu; Ohmori, Takashi; Tamura, Zensuke; Uchiyama, Yoshihiro; and Ohshima, Ryoichiro, 4,429,538, Cl. 60-748.000.

Ohno, Akira; Sato, Toshiaki; and Inoue, Kanji, to NHK Spring Co., Ltd. Hollow stabilizer for vehicle. 4,429,899, Cl. 280-689.000.

Ohshima, Ryoichiro: *See*—
Sato, Isao; Ishibashi, Yohji; Minakawa, Yoshimitsu; Ohmori, Takashi; Tamura, Zensuke; Uchiyama, Yoshihiro; and Ohshima, Ryoichiro, 4,429,538, Cl. 60-748.000.

Ohta, Akio: *See*—
Watanabe, Tadao; Ohhori, Mitsuo; Ohta, Akio; and Kondo, Yoshikazu, 4,430,386, Cl. 428-555.000.

Ohta, Jun: *See*—
Utsumi, Hiroo; Sakakibara, Yukio; Ito, Teruyoshi; Iwata, Toshiharu; Ohta, Jun; Kazi, Kiyokane; Hori, Osamu; and Banno, Mitsuyuki, 4,429,565, Cl. 73-35.000.

Ohyabu, Shuzo; Kawai, Syuji; and Matsumura, Keiji, to Kuraray Company, Ltd. Method for production of formed food product of microfibrillar milk protein. 4,430,356, Cl. 426-574.000.

Oiry, Joel; and Imbach, Jean-Louis. Cystamine derivatives suitable for use as medicaments. 4,430,347, Cl. 424-322.000.

Oishi, Norio: *See*—
Sakuyama, Masaki; Oishi, Norio; Okamoto, Kouichi; Iwamoto, Masatami; Nomura, Tatsuei; and Nakamura, Shiro, 4,430,589, Cl. 310-52.000.

Ojima, Nobuyuki: *See*—
Tamura, Tooru; Ojima, Nobuyuki; Mochizuki, Hideaki; Souno, Ryuichi; and Ikka, Toshifumi, 4,430,688, Cl. 361-307.000.

Okabe, Katsuhiko, to Copal Company Limited. Printed paper feeding device for photograph processing apparatus. 4,429,988, Cl. 355-28.000.

Okada, Hitoshi: *See*—
Yamaguchi, Katsumi; and Okada, Hitoshi, 4,430,680, Cl. 360-137.000.

Okada, Osamu, to Minolta Camera Kabushiki Kaisha. Paper feed device. 4,429,865, Cl. 271-170.000.

Okada, Toshio; Motoyama, Katsumi; and Yoshii, Takashi, to Nippon Electric Co., Ltd. Fluorescent display tube. 4,430,598, Cl. 313-497.000.

Okamoto, Kouichi: *See*—
Sakuyama, Masaki; Oishi, Norio; Okamoto, Kouichi; Iwamoto, Masatami; Nomura, Tatsuei; and Nakamura, Shiro, 4,430,589, Cl. 310-52.000.

Okaniwa, Kenichiro: *See*—
Koyama, Mikio; Kikugawa, Shozo; Okaniwa, Kenichiro; and Tamaki, Kiyoshi, 4,430,436, Cl. 436-531.000.

Okano, Takashi, to Fujitsu Limited. Process for fabricating a semiconductor device. 4,430,152, Cl. 156-643.000.

Okauchi, Ken; and Kobayashi, Tatsuhiko, to Konishiroku Photo Industry Co., Ltd. Color photographic light-sensitive material. 4,430,424, Cl. 430-537.000.

Okudaira, Sadayuki: *See*—
Suzuki, Keizo; Okudaira, Sadayuki; Nishimatsu, Shigeru; and Kanonata, Ichiro, 4,430,138, Cl. 156-345.000.

Okuma Howa Kikai Kabushiki Kaisha: *See*—
Senda, Masaki; and Mizoguchi, Takashi, 4,430,717, Cl. 364-474.000.

Oldham, Delbert J.; and Karish, John A., to General Dynamics, Pomona Division. Airborne missile launcher. 4,429,611, Cl. 89-1.816.

Olin Corporation: *See*—
Fiorucci, Louis C., 4,430,241, Cl. 252-70.000.
Ford, James M.; and Wright, David B., 4,430,179, Cl. 204-128.000.
Gray, Thomas J., 4,430,186, Cl. 204-242.000.

Olive, Clive E.: *See*—
Knight, Ronald W.; and Olive, Clive E., 4,430,043, Cl. 415-159.000.

Oliver, Donald W.; and Chace, David M., to Dresser Industries, Inc. Method and apparatus for neutron induced gamma ray logging for direct porosity identification. 4,430,567, Cl. 250-270.000.

Oliver, John W. H., to Australian Road Research Board. Pavement binder composition. 4,430,464, Cl. 524-59.000.

Ollis, John R.: *See*—
Baur, Bruce K.; and Ollis, John R., 4,430,641, Cl. 340-347.0DA.

Olofsson, Bo H. O., to Tetra Pak Developpement SA. Inductor for induction welding and a method for the manufacture of the same. 4,430,543, Cl. 219-10.790.

Olschewski, Armin; Brandenstein, Manfred; Kunkel, Heinrich; Hetterich, Hermann; Horling, Peter; and Walter, Lothar, to SKF Kugellagerfabriken GmbH. Thin-walled bearing bushings manufactured by a deep drawing process. 4,429,926, Cl. 308-216.000.

Olson, Edward F.; and Olson, Robert F. Water powered fish feeder. 4,429,660, Cl. 119-51.00R.

Olson, Robert F.: *See*—
Olson, Edward F.; and Olson, Robert F., 4,429,660, Cl. 119-51.00R.

Olsson, Robert P., to Western Plastics Corporation. Belling mandrel assembly. 4,430,052, Cl. 425-392.000.

Olszanski, Dennis J.: *See*—
Durante, Vincent A.; Olszanski, Dennis J.; Reagan, William J.; and Brown, Stanley M., 4,430,199, Cl. 208-114.000.

Oltrogge, Robert D., to Standard Oil Company, (Indiana); and Gulf Oil Corporation. Fluid bed retorting process with lateral flow. 4,430,195, Cl. 208-8.00R.

Olympus Optical Co., Ltd.: *See*—
Fujiwara, Hiroshi, 4,429,970, Cl. 354-413.000.
Hosoda, Seiichi, 4,429,686, Cl. 128-6.000.
Ikari, Kazuo, 4,429,978, Cl. 354-224.000.
Kamachi, Shinichi; and Fujiwara, Toshihide, 4,429,996, Cl. 356-344.000.
Mizokami, Kazunori, 4,429,971, Cl. 354-415.000.
Osanai, Akira, 4,430,677, Cl. 360-966.000.
Terada, Katumi, 4,429,979, Cl. 354-289.100.

Omran, Jafar; and Koch, Karl-Heinz, to Rutgerswerke Aktiengesellschaft. Method for the production of a highly aromatic pitch-like coal by-product. 4,430,194, Cl. 208-8.0LE.

O'Neal, William C.; and Grasby, James L. Security door bar system. 4,429,911, Cl. 292-259.00R.

Omics, Inc.: *See*—
Talbert, William L., 4,429,675, Cl. 123-558.000.

Onitsuka, Nobuyuki; Fukamachi, Masaaki; and Sueyoshi, Masahiko, to Kabushiki Kaisha Honda Rukku. Electric type speed meter. 4,430,612, Cl. 324-166.000.

Ono, Michio: *See*—
Aoki, Kozo; and Ono, Michio, 4,430,423, Cl. 430-384.000.

Ono, Mikiya: *See*—
Niwa, Shigeo; Sawai, Kazuhiko; Takahashi, Shinobu; Tagai, Hideo; Ono, Mikiya; Fukuda, Yoshiaki; and Takeuchi, Hiroyasu, 4,429,691, Cl. 128-92.00C.

Ono, Yoshihiro; and Sunagawa, Hiroshi, to Fuji Photo Film Co., Ltd. Xeroradiographic material and method of making same. 4,430,405, Cl. 430-95.000.

Onuma, Shigeharu: *See*—
Hosoya, Akira; Tamahashi, Kunihiro; Onuma, Shigeharu; Kakuta, Atsushi; Mori, Yasuki; Suzuki, Katsuhito; and Morishita, Hirosada, 4,430,404, Cl. 430-58.000.

Ooi, Hiroshi: *See*—
Yamazaki, Shigeru; Hirao, Motoaki; Yamagishi, Tatuo; Nagai, Jun; Ooi, Hiroshi; and Shinozaki, Yoshinobu, 4,430,116, Cl. 75-34.000.

Ooizumi, Junichi: *See*—
Kamejima, Kohji; Hibino, Yozo; Ooizumi, Junichi; Tanaka, Hideki; and Tamura, Morio, 4,429,541, Cl. 62-201.000.

Orain, Michel A., to Glaenzer Spicer. Ball bearing method for assembling the bearing and an apparatus for grinding the bearing. 4,429,925, Cl. 308-189.00R.

Orangeburg Technologies, Inc.: *See*—
Burnham, Francis L., 4,429,540, Cl. 62-188.000.

Osanai, Akira, to Olympus Optical Co., Ltd. Cassette tape recorder. 4,430,677, Cl. 360-966.000.

Osborn, James G.: *See*—
Bowman, Donald B.; Filz, Charles J.; and Osborn, James G., 4,430,098, Cl. 55-191.000.

Oshima, Harumi; and Uno, Tukasa, to Tokico Ltd. Floating caliper type disc brake. 4,429,769, Cl. 188-73.310.

Osos, George R.: *See*—
Dodelin, Richard W.; Hurst, Darrell W.; and Osos, George R., 4,429,472, Cl. 34-48.000.

Osterman, Nils P. E. Means for manufacturing section multi-ply cardboard. 4,430,144, Cl. 156-497.000.

Otani, Tony U., to Wexco Corporation. Composite cylinder and casting alloy for use therein. 4,430,389, Cl. 428-627.000.

Otis Engineering Corporation: *See*—
Williamson, Jimmie R., Jr., 4,429,747, Cl. 166-321.000.

Otobe, Yutaka: *See*—
Gotoh, Osamu; Otobe, Yutaka; Kawamoto, Michio; and Fujimura, Akira, 4,429,676, Cl. 123-571.000.

Otsuki, Haruaki; Hirai, Hiromu; and Kawauchi, Masataka, to Hitachi, Ltd. Sheet feeding apparatus. 4,430,606, Cl. 318-601.000.

Ovshinsky, Stanford R.; Sapru, Krishna; and Venkatesan, Srinivasan, to Energy Conversion Devices, Inc. Fuel cell cathode. 4,430,391, Cl. 429-40.000.

Owatonna Tool Company: *See*—
Davis, Marvin A., 4,429,447, Cl. 29-275.000.

Owens-Corning Fiberglas Corporation: *See*—
Bhatti, Mohinder S.; and Marzocchi, Alfred, 4,430,105, Cl. 65-1.000.
Goodridge, Paul A., 4,430,106, Cl. 65-15.000.

Oya, Masayuki: *See*—
Iwao, Junichi; Oya, Masayuki; Baba, Toshio; Iso, Tadashi; and Chiba, Takehisa, 4,430,344, Cl. 424-270.000.

Pace, Charles H.: *See*—
Margetts, Hugh G.; and Pace, Charles H., 4,429,768, Cl. 188-71.900.

Pachonik, Horst: *See*—
Eilers, Carl-Ernst; and Pachonik, Horst, 4,430,190, Cl. 204-298.000.

Pacific Engineering Co., Ltd.: *See*—
Ebi, Masashi, 4,430,633, Cl. 337-166.000.

Page, Edward H.: *See*—
Scotti, Frank; and Page, Edward H., 4,429,814, Cl. 222-402.130.

Page, Robert E.; and Brackett, Raymond B., to United States of America, Navy. Programmable bootstrap loading system. 4,430,704, Cl. 364-200.000.

Painter, Alfred E., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Desensitizing explosives. 4,430,132, Cl. 149-109.600.

Pako Corporation: *See*—
Miller, Clare K., 4,429,980, Cl. 354-311.000.

Palamara, Anthony. Boat trailer. 4,429,893, Cl. 280-414.100.

Palmquist, Ronald W., to Corning Glass Works. Method of regulating fuel and air flow to a glass melting furnace. 4,430,109, Cl. 65-32.000.

Palovaara, Jaakko, to Valmet Oy. Apparatus for leading the tail of web of paper. 4,429,819, Cl. 226-95.000.

Paoli, Bruno, to International Paper Company. Finishing device for packaging containers. 4,429,511, Cl. 53-379.000.

Papadakis, Alexandros M. Automotive vehicle wheel illumination and light reflective system. 4,430,692, Cl. 362-32.000.

Paradis, Joseph R., to Dennison Manufacturing Company. Assemblages of fasteners. 4,429,437, Cl. 24-150.0FP.

Paraflexor: *See*—
LeBlanc, James S.; and Uke, Alan K., 4,429,868, Cl. 272-93.000.

Park, John W. Scaffold system for use in sandblasting. 4,429,764, Cl. 182-129.000.

Parker, Norman A. Automobile safety light. 4,430,638, Cl. 340-139.000.

Pasquini, Richard J.; Brown, Harold; and Kostiuk, Alan, deceased (by Kostiuk, Barbara, administratrix), to Becton, Dickinson and Company. Syringe assembly with snap-fit components. 4,430,080, Cl. 604-240.000.

Passariello, Attilio, to Ammonia Casale S.A. Spherical cerium-activated catalyst for ammonia synthesis and process for its manufacture. 4,430,254, Cl. 502-243.000.

Patel, Suman H.: *See*—
Wieser, James B.; and Patel, Suman H., 4,430,621, Cl. 330-9.000.

Paterson, Laurene O. Process for removing dissolved iron from water. 4,430,228, Cl. 210-665.000.

Patt, Tom E.; Argoudelis, Alexander D.; and Marshall, Vincent P., to Upjohn Company, The. Process for preparing lincomycin and clindamycin ribonucleotides. 4,430,495, Cl. 536-16.300.

Patterson, Roy A.: *See*—
Ofield, L. Ronald; Puurits, Leonhard; and Patterson, Roy A., 4,430,521, Cl. 174-65.00R.

Patterson, Thomas C.; and Campbell, David L., to Cannondale Corporation. Carrier racks for bicycles. 4,429,818, Cl. 224-39.000.

Patterson, William P.; and Bailey, Ronald J., to Hoffert Manufacturing Co., Inc. High energy emulsifier. 4,430,251, Cl. 252-359.00R.

Patzke, James V.; and Rosenberg, Burton J., to Burroughs Wellcome Co. Assay system. 4,430,435, Cl. 436-504.000.

Patzschke, Hans-Peter: *See*—
Jaeger, Kurt E.; Klein, Klausjorg; Patzschke, Hans-Peter; and Saatweber, Dietrich, 4,430,462, Cl. 523-402.000.

Pauga, Uldis, to Eutectic Corporation. Flux-cored arc welding tubular electrode. 4,430,122, Cl. 75-123.00B.

Pavek, Karel: *See*—
Ferkl, Frantisek; Cap, Antonin; Vecera, Milos; Skala, Josef; Kopriva, Vaclav; Blasko, Michal; Pavek, Karel; Chrtek, Milan; and Blasko, Jan, 4,429,522, Cl. 57-301.000.

Payne, Charles C., to Nalco Chemical Company. Silica sol penetration and saturation of thermal insulation fibers. 4,430,369, Cl. 427-397.700.

Payne, Robert M.; and Haire, Christopher A. R., to Research Engineers Limited. Visual landing aids for aircraft. 4,430,695, Cl. 362-277.000.

Payview Limited: *See*—
Cheung, William S. H., 4,430,669, Cl. 358-122.000.

Pearce, Homer L., to Eli Lilly and Company. 12'-Iodo derivatives of dimeric indole-dihydroindole alkaloids, and process for preparing them. 4,430,269, Cl. 260-244.400.

Pearson, James H.: *See*—
Halliburton, Ronald D.; Pearson, James H.; and Sava, Robert J., 4,429,876, Cl. 273-121.00A.

Pearson, Robert M., to Kaiser Aluminum & Chemical Corporation. Calcination control system. 4,430,719, Cl. 364-503.000.

Pease, Gerald F. Re-sealer for tab-retaining pop-top cans. 4,429,804, Cl. 220-247.000.

Pegon, Alexander A., Jr., to Diversified Eastern, Inc. Tray-loading machine. 4,429,512, Cl. 53-534.000.

Peltier, Raymond. Method for separating the isotopes of an element in particular of a metal having a high atomic weight. 4,430,307, Cl. 423-3.000.

Penniman, Scott R.: *See*—
Clery, Howard K., Jr.; and Penniman, Scott R., 4,429,901, Cl. 282-29.00B.

Penrod, Leroy: *See*—
Horton, Johnnie A., 4,430,275, Cl. 261-18.00B.

Perbet, Jean-Noel: *See*—
Billard, Jean; Dubois, Jean-Claude; Hareng, Michel; Le Berre, Serge; and Perbet, Jean-Noel, 4,430,650, Cl. 340-784.000.

Perkin-Elmer Corporation, The: *See*—
Scott, Larkin; and Muellner, William C., 4,430,657, Cl. 346-32.000.
Williams, Charles J., 4,429,991, Cl. 356-73.000.

Perkin-Elmer Limited: *See*—
Turner, Andrew J., 4,429,736, Cl. 165-61.000.

Perl, Horst; Nussbaumer, Dietmar; Schmidt, Hans-Weddo; Pradel, Gunter; and Grummert, Ulrich, to Sartorius GmbH. Separating device for fluids, consisting of support plates and cut sections of a semi-permeable diaphragm. 4,430,218, Cl. 210-321.300.

Perrey, Hermann: *See*—
Alfes, Franz; Perrey, Hermann; Meyer, Karl-Heinrich; Heine, Diez; and Kowitz, Friedrich, 4,430,483, Cl. 525-356.000.

Perron, Robert: *See*—
Gauthier-Lafaye, Jean; and Perron, Robert, 4,430,506, Cl. 560-105.000.

Pertsovsky, Viktor N.: *See*—
Zhukovsky, Sergei S.; Junovich, July M.; Pertsovsky, Viktor N.; Kolesnikov, Vyacheslav S.; Renzhin, Igor P.; and Rivkin, Semen L., 4,430,441, Cl. 501-109.000.

Peter, Heinrich: *See*—
Heusler, Karl; Bickel, Hans; Fechtig, Bruno; Peter, Heinrich; and Scartazzini, Riccardo, 4,430,498, Cl. 544-16.000.

Peters, Paul: *See*—
Feldhoff, Karl; and Peters, Paul, 4,429,664, Cl. 122-376.000.

Peterson, Bo: *See*—
Edelton, Soren; and Peterson, Bo, 4,429,633, Cl. 102-222.000.

Peterson, David D. Thermal release device. 4,430,552, Cl. 219-200.000.

Peterson, Robert R., to Barry Wright Corporation. Bartlett coupling. 4,430,065, Cl. 464-90.000.

Peton, Nicole: *See*—
Steiner, Jean-Pierre; Melin, Christiane; Platon, Jean-Francois; and Peton, Nicole, 4,429,859, Cl. 252-8.800.

Petrovic, Vladan; Schmid, Karl; Jokisch, Friedrich; and Rotthaus, Heinz, to Krupp-Koppers GmbH. Cascaded coal drier for a coking plant. 4,430,161, Cl. 202-228.000.

Petty, Luther E.: *See*—
Reed, Robert L.; Petty, Luther E.; and Goddin, Clifton S., Jr., 4,430,317, Cl. 423-574.00R.

Pfizer Inc.: *See*—
Campbell, Simon F.; Cross, Peter E.; and Stubbs, John K., 4,430,333, Cl. 424-266.000.
Holland, Gerald F., 4,430,337, Cl. 424-272.000.

Pfluger, Walter, to Agathon A.G. Maschinenfabrik. Antifriction axial guide means. 4,429,922, Cl. 308-6.00R.

Pfuhl, Berthold: *See*—
Leutner, Volkmar; and Pfuhl, Berthold, 4,429,619, Cl. 91-29.000.

Phillips Petroleum Company: *See*—
Abbott, Clifford E., 4,430,465, Cl. 524-64.000.
Bobsein, Rex L., 4,430,515, Cl. 585-530.000.
Cooper, William T., 4,430,466, Cl. 524-83.000.
Gentry, Cecil C.; and Small, William M., 4,429,739, Cl. 165-159.000.
Gray, Michael L.; and McClintock, William A., 4,430,103, Cl. 62-28.000.
Hopkins, Thomas R., 4,430,427, Cl. 435-25.000.
Kukes, Simon G., 4,430,207, Cl. 208-251.00H.
Wu, Yulin, 4,430,511, Cl. 562-481.000.

Phillips, Robert F.: *See*—
McIntyre, James A.; Phillips, Robert F.; and Lefevre, Joseph D., 4,430,177, Cl. 204-98.000.

Phulpin, Francois J.: *See*—
Segarra, Gerard; and Phulpin, Francois J., 4,430,699, Cl. 364-200.000.

Piasecki, Raymond F., to Thomas & Betts Corporation. Electrical cable assembly. 4,429,939, Cl. 339-97.00C.

Piccirilli, Robert: *See*—
Chang, Wen-Hsuan; Piccirilli, Robert; and Kasper, Walter F., 4,430,486, Cl. 525-44.000.

Picker, Carsten: *See*—
Schaefer, Philipp; Picker, Carsten; and Schaefer, Helmut, 4,430,448, Cl. 521-54.000.

Pierce, Robert C.; and Bala, Frank J., Jr., to Colgate-Palmolive Co. Liquid detergent having high grease removal ability. 4,430,237, Cl. 252-173.000.

Pierson, Gerald R., to McQuay-Perfex Inc. Screw conveyer with removable flighting. 4,429,782, Cl. 198-677.000.

Piesch, Steffen: *See*—
Honel, Hans; Michel, Walter; Piesch, Steffen; Schluter, Karin; Seidel, Manfred; and Spieler, Wolfgang, 4,430,380, Cl. 428-254.000.
Honel, Hans; Michel, Walter; Piesch, Steffen; Schluter, Karin; and Wolf, Alfons, 4,430,494, Cl. 528-254.000.

Pioneer Electronic Corporation: *See*—
Sakamoto, Masaharu, 4,430,630, Cl. 334-15.000.

Pitney Bowes Inc.: *See*—
Dlugos, Daniel F.; and Manduley, Flavio M., 4,430,716, Cl. 364-466.000.

Pitt, William V. Atmospheric resistant doors. 4,429,498, Cl. 52-204.000.

Pizzini, Louis C.: *See*—
Austin, Arthur L.; Levis, William W., Jr.; Pizzini, Louis C.; and Hartman, Robert J., 4,430,247, Cl. 252-182.000.

Plasticair Systems 442829 Ontario Inc.: *See*—
Sixsmith, Richard, 4,430,101, Cl. 55-440.000.

Platon, Jean-Francois: *See*—
Steiner, Jean-Pierre; Melin, Christiane; Platon, Jean-Francois; and Peton, Nicole, 4,429,859, Cl. 252-8.800.

Plessey Overseas Limited: *See*—
Matthews, Robert B.; and Davies, Guy E., 4,429,528, Cl. 60-39.281.

Pletcher, Wayne A.: *See*—
Merton, W. Randolph; and Pletcher, Wayne A., 4,430,479, Cl. 525-127.000.

Plibrico (Canada) Limited: *See*—
Davis, Raymond W., 4,429,721, Cl. 138-149.000.

PLK Papier- und Kunstoff Werke Linnich GmbH: *See*—
Farber, Jurgen, 4,429,828, Cl. 229-75.000.

Pluribus Products, Inc.: *See*—
Martino, Peter V.; and Meyers, Peter, 4,429,982, Cl. 354-318.000.

Pokora, Bohdan M.: *See*—
Callaghan, Vincent M.; Flynn, Edward P.; and Pokora, Bohdan M., 4,430,293, Cl. 376-314.000.
Polaroid Corporation: *See*—
Benton, Stephen A., 4,429,947, Cl. 350-3.850.
Poling, Dwayne E.: *See*—
Aiello, Robert P.; Stefanidakis, George; and Poling, Dwayne E., 4,430,204, Cl. 208-240.000.
Polk, Donald E.: *See*—
Ray, Ranjan; Polk, Donald E.; and Giessen, Bill C., 4,430,115, Cl. 75-0.50R.
Pommer, Ernst-Heinrich: *See*—
Rentzea, Costin; Zeeh, Bernd; and Pommer, Ernst-Heinrich, 4,430,336, Cl. 424-272.000.
Pont-a-Mousson S.A.: *See*—
Fuminier, Claude B., 4,429,445, Cl. 29-33.00T.
Pope, James M.; and Laboda, Edward J., to United States of America, Energy. Alcohol-free alkoxide process for containing nuclear waste. 4,430,257, Cl. 252-629.000.
Pope, James M.: *See*—
Radford, Kenneth C.; and Pope, James M., 4,430,276, Cl. 264-0.500.
Pope, Jerry O. Ridge leveler. 4,429,750, Cl. 172-253.000.
Portec, Inc.: *See*—
Morgan, David P., 4,430,032, Cl. 410-68.000.
Portmann, Hubert, to Asulab S.A. Passive electro-optical display with screen and control electrodes. 4,429,955, Cl. 350-332.000.
Pospich, Gunther; and Zimmermann, Wolfgang, to Hoechst Aktiengesellschaft. Open-pore molded article based on polyvinyl acetals, and a process for its preparation. 4,430,447, Cl. 521-53.000.
Post Office: *See*—
Betts, Colin R., 4,430,745, Cl. 375-25.000.
Hardy, John H. M.; Barrett, Robert E.; Allwood, Anthony R.; Riley, Garth I.; Hovell, John; Smith, Donald W.; Potter, Arthur R.; and Lowrie, Ian W., 4,430,733, Cl. 370-110.100.
Postner, Hermann, to Societe d'Assistance Technique pour Produits Nestle S.A. Preparation of fresh chopped onions which may be dispensed from tubes. 4,430,352, Cl. 426-115.000.
Potter, Arthur R.: *See*—
Hardy, John H. M.; Barrett, Robert E.; Allwood, Anthony R.; Riley, Garth I.; Hovell, John; Smith, Donald W.; Potter, Arthur R.; and Lowrie, Ian W., 4,430,733, Cl. 370-110.100.
Powell, Patrick L., to Standard Car Truck Company. Hubodometer. 4,430,561, Cl. 235-95.00B.
Poynor, Paul C.; and Romine, Hugh E., to Conoco Inc. Hydrogen donor cracking with donor soaking of pitch. 4,430,197, Cl. 208-56.000.
PPG Industries, Inc.: *See*—
Chang, Wen-Hsuan; Piccirilli, Robert; and Kasper, Walter F., 4,430,486, Cl. 525-44.000.
Claassen, George R.; and Ewing, John J., 4,430,111, Cl. 65-114.000.
Doerge, Herman P., 4,430,490, Cl. 528-77.000.
Frank, Robert G.; Claassen, George R.; Ewing, John J.; and Fecik, Michael T., 4,430,110, Cl. 65-104.000.
Pradel, Gunter: *See*—
Perl, Horst; Nussbaumer, Dietmar; Schmidt, Hans-Weddo; Pradel, Gunter; and Grummert, Ulrich, 4,430,218, Cl. 210-321.300.
Pratt, Roy E.: *See*—
Castagnos, Leonce F., Jr.; and Pratt, Roy E., 4,430,201, Cl. 208-164.000.
Preuss, Wolfgang, to Henkel Kommanditgesellschaft auf Aktien. Process for the production of delta 4-C21-steroid compounds. 4,430,270, Cl. 260-397.100.
Price, Christopher P.: *See*—
Hammond, Peter M.; Price, Christopher P.; and Scawen, Michael D., 4,430,433, Cl. 435-228.000.
Priebe, Edmund: *See*—
Schmitt, Burghard; Benker, Klaus; Priebe, Edmund; and Lindenschmidt, Gerhard, 4,430,478, Cl. 525-71.000.
Procter & Gamble Company, The: *See*—
Bragg, Charles D., 4,430,243, Cl. 252-91.000.
Schaefer, Jean E., 4,430,148, Cl. 156-580.200.
Public Health Laboratory Service Board: *See*—
Hammond, Peter M.; Price, Christopher P.; and Scawen, Michael D., 4,430,433, Cl. 435-228.000.
Puckett, P. Brooks, Jr., to Meridian Industries, Inc. Surgical sponge counter. 4,429,789, Cl. 206-370.000.
Pupp, Herwig; Andersson, Otto B.; and Nilsson, Jan-Erik, to Tetra Pak International AB. Method and an arrangement for the manufacture of casings. 4,430,140, Cl. 156-356.000.
Puurits, Leonhard: *See*—
Ofield, L. Ronald; Puurits, Leonhard; and Patterson, Roy A., 4,430,521, Cl. 174-65.00R.
Pytlewski, Louis J.; and Thorne, Edward J., to Franklin Institute, The. Method for the solvent extraction of polychlorinated biphenyls. 4,430,208, Cl. 208-262.000.
Quaker Fabric Corp.: *See*—
Herzog, Earl E., 4,429,722, Cl. 139-48.000.
Quaker Oats Company, The: *See*—
Akerberg, Denis W.; Huffman, George W.; and Rude, Carl A., 4,430,459, Cl. 523-144.000.
Quell, Peter: *See*—
Forster, Siegfried; and Quell, Peter, 4,429,830, Cl. 237-19.000.
Quesnel, Guy, to Societe anonyme dite: Stein Industrie. Method and apparatus for burning damp oil-shales of low heating power. 4,429,646, Cl. 110-347.000.
Quigg, Allen B., to General Electric Company. Turbine turning gear with hydraulic overspeed drive. 4,430,575, Cl. 290-52.000.
Quinn, Clayton B., to General Electric Company. Polyester-carbonate resin blends. 4,430,484, Cl. 525-425.000.
R. A. Jones & Co. Inc.: *See*—
Scarpa, Eric W.; Hughes, Charles C.; and Humbert, Stanley F., 4,429,864, Cl. 271-10.000.
R. H. Nelson Holdings Ltd.: *See*—
Nelson, Robert H., 4,429,625, Cl. 99-425.000.
Rabay, Michel N. R. Electric grill. 4,430,559, Cl. 219-460.000.
Rabe, Gunter: *See*—
Dorner, Heinrich; and Rabe, Gunter, 4,429,663, Cl. 122-365.000.
Rabin, Harvey: *See*—
Hampar, Berge; Zweig, Martin; and Rabin, Harvey, 4,430,437, Cl. 436-548.000.
Racek, Alfred. Gas lighter. 4,430,060, Cl. 431-276.000.
Rachfalski, Gary: *See*—
Barry, Robert C.; and Rachfalski, Gary, 4,429,574, Cl. 73-580.000.
Radelkis Elektrokemiai Muszergyarto Szovetkezet: *See*—
Daroczy, Janos; Erdelyi, Janos; Havas, Jeno; Kecskes, Lajos; and Muller, Henrik, 4,430,164, Cl. 204-1.00T.
Raden, Daniel S.; Carlsen, Russell O.; and Narducy, Kenneth W., to Abbott Laboratories. N'-(2-Hydroxyalkyl)-N, N, N'-trimethyl-propylene diamines as catalysts for polyurethane foams. 4,430,455, Cl. 521-118.000.
Radford, Kenneth C.; and Pope, James M., to Westinghouse Electric Corp. Method of making stable UO_2 fuel pellets. 4,430,276, Cl. 264-0.500.
Radiall: *See*—
Cartier, Jacques, 4,429,949, Cl. 350-96.210.
Radio Shack: *See*—
Leininger, Steven, 4,430,649, Cl. 340-731.000.
Rainey, James H.: *See*—
John, Gunter; Rainey, James H.; and Valembois, Pierre V., 4,429,678, Cl. 125-39.000.
Rakoczynski, Randolph W.: *See*—
Wagner, Louis E.; Rakoczynski, Randolph W.; and Flannery, Harold F., 4,430,021, Cl. 405-129.000.
Ramaesten, Ivan O., to Forenade Fabriksverken. Mandrel for cold forging internally profiled tubes or cylinders. 4,429,561, Cl. 72-478.000.
Ramos, Homer: *See*—
Garcia, Gilbert C., 4,429,765, Cl. 182-153.000.
Randolphi, Peter P. M. Ice-cream freezer. 4,429,549, Cl. 62-342.000.
Range, Alfred P. Tobacco leaf grading and stripping apparatus. 4,429,861, Cl. 269-40.000.
Ranke, Gerhard; and Weiss, Horst, to Linde Aktiengesellschaft. Scrubbing system yielding high concentration of hydrogen sulfide. 4,430,316, Cl. 423-573.00R.
Rankel, Lillian A., to Mobil Oil Corporation. Demetalation of hydrocarbonaceous feeds with H_2S. 4,430,206, Cl. 208-251.00R.
Rapid Engineering, Inc.: *See*—
Dirkes, James V., 4,429,679, Cl. 126-110.00A.
Rapp, Erich: *See*—
Eistetter, Klaus; and Rapp, Erich, 4,430,339, Cl. 424-278.000.
Rasbach, Heinz: *See*—
Hughes, John; and Rasbach, Heinz, 4,430,027, Cl. 405-303.000.
Rasmussen, Ole-Bendt. Method of coextruding mechanically interconnected multi-layer laminates with mecanical layer interconnection. 4,430,284, Cl. 264-171.000.
Rauma-Repola Oy: *See*—
Tuuha, Rolf, 4,430,210, Cl. 209-23.400.
Rauser, Richael: *See*—
Bez, Ulrich; Schroder, Gerhard; and Rauser, Richael, 4,429,914, Cl. 296-188.000.
Ray, Ranjan; Polk, Donald E.; and Giessen, Bill C., to Marko Materials, Inc. Boron stainless steel powder and rapid solidification method. 4,430,115, Cl. 75-0.50R.
Rayovac Corporation: *See*—
Davis, Stuart M.; and Davidson, Greg J., 4,430,395, Cl. 429-158.000.
Raytheon Company: *See*—
Day, William J., Jr., 4,430,541, Cl. 219-10.55R.
Matthews, James B., 4,429,997, Cl. 356-350.000.
RCA Corporation: *See*—
Acampora, Alfonse, 4,430,721, Cl. 364-724.000.
Berkman, Samuel, 4,430,149, Cl. 156-613.000.
Cochran, Larry A., 4,430,665, Cl. 358-37.000.
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Runyan, Gary L.; and Sloan, Paul H., Jr., to Nibco Inc. Method and apparatus for preventing thermal damage to a preformed plug during molding of a housing therearound. 4,430,285, Cl. 264-242.000.

Ruppel, Anthony D.; Williams, Monte; and Willis, Larry, to Hamilton Glass Products Incorporated. Mirror package and method of forming. 4,429,791, Cl. 206-454.000.

Rusenko, James J.; and Rzepecki, Marian M., to Eaton Corporation. Spring jaw fuse clip and integrally retained fuse puller. 4,429,936, Cl. 339-45.00R.

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Rutty, Edward C.; and Stoutenberg, Carl C., to Stanley Works, The. Variable stiffness rule blade, rule employing same, and method of making same. 4,429,462, Cl. 33-138.000.

Ryan, John J.; and Laskey, Peter P. Ceramic workpiece holder. 4,430,058, Cl. 432-259.000.

Ryu, Ji-yong, to Exxon Research & Engineering Co. Process for synthesizing a multicomponent acidic catalyst composition by an organic solution method. 4,430,252, Cl. 502-162.000.

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Sacchetti, Peter J., to New England Instrument Company. Variable resistance device. 4,430,635, Cl. 338-176.000.

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Saga, Ryokichi; and Takimoto, Yukio, to Nippon Electric Co., Ltd. Switch matrix apparatus for satellite-switched TDMA system or the like. 4,430,732, Cl. 370-54.000.

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Sakao, Nobuo; and Kuraoka, Yasuo, to Hoxan Corporation. Method of freezing fertilized ova, spermatozoa or the like and apparatus therefor. 4,429,542, Cl. 62-62.000.

Sakata, Kaoru: *See*—
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Sakuyama, Masaki; Oishi, Norio; Okamoto, Kouichi; Iwamoto, Masatami; Nomura, Tatsuei; and Nakamura, Shiro, to Mitsubishi Denki Kabushiki Kaisha. Rotor of a superconductive rotary electric machine. 4,430,589, Cl. 310-52.000.

Salomon, Phil M.; and Smilowitz, Kalman, to United States of America, National Aeronautics and Space Administration. Programmable scan/read circuitry for charge coupled device imaging detectors. 4,430,673, Cl. 358-213.000.

Salsbury, Michael A., to Multikey Ltd. Revolving cylinder locks. 4,429,555, Cl. 70-366.000.

Sand, Duane B., to Burroughs Corporation. Branch prediction apparatus and method for a data processing system. 4,430,706, Cl. 364-200.000.

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Santucci, Donald. Bridging clip cover. 4,430,524, Cl. 174-138.00F.

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Sato, Isao; Ishibashi, Yohji; Minakawa, Yoshimitsu; Ohmori, Takashi; Tamura, Zensuke; Uchiyama, Yoshihiro; and Ohshima, Ryoichiro, to Hitachi, Ltd. Gas turbine combustor. 4,429,538, Cl. 60-748.000.

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Sauer, Hans; Takada, Takashi; and Kondo, Yukihiro, to Sauer, Hans. Getter and electrical switching system using such getter. 4,430,537, Cl. 200-302.100.
Saumweber, Eckart; and Schirmer, Klaus, to Knorr-Bremse GmbH. Anti-lock device for vehicle brakes. 4,430,703, Cl. 364-426.000.
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Scalf, Gerald W., to Texas Instruments Incorporated. Data input apparatus for microwave oven controllers. 4,430,540, Cl. 219-10.55B.
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Schwabacher, William, to Hoffmann-La Roche Inc. Hypodermic syringe assembly. 4,430,082, Cl. 604-263.000.
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ServiceMaster Industries, Inc.: *See*—
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Sheets, Kerney T. Projectable lawn sprinkler. 4,429,832, Cl. 239-204.000.
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Sheingorn, Larry A. Visual field testing device. 4,429,961, Cl. 351-226.000.
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Shihabi, David S., to Mobil Oil Corporation. Hydrocarbon conversion process. 4,430,200, Cl. 208-120.000.
Shima, Shigeru, to Nichias Corporation; and Hiroyasu Iihoshi. Method for covering the surface of molten metal, and a covering material therefor. 4,430,121, Cl. 75-96.000.
Shimada, Hirofumi; and Totsuka, Hisao, to Tokyo Shibaura Denki Kabushiki Kaisha. Radioactive gaseous waste disposing system. 4,430,292, Cl. 376-301.000.
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Smith, Richard H., Sr. Helical seam structural vessel, method and apparatus of forming same. 4,429,654, Cl. 114-65.00R.
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Gentet, Pierre; Geoffroy, Alain Y.; and Caillebotte, Alain M., 4,430,715, Cl. 364-426.000.
Soddy, Thomas C.: *See*—
Fritz, William E.; and Soddy, Thomas C., 4,429,921, Cl. 308-3.500.
Soeda, Masumitsu: *See*—
Miyafuji, Motohisa; Matsui, Takashi; Harada, Hidekazu; Soeda, Masumitsu; Ishikawa, Shin; Murakado, Hiroshi; Kawamoto, Hiroaki; Tabuchi, Takeo; Kamada, Kunio; and Nakashima, Yasuhiro, 4,430,298, Cl. 420-481.000.
Sokolowski, Eugene K. Closing mechanism for a cabinet cover. 4,429,933, Cl. 312-319.000.
Solar, Ronald J.: *See*—
Ganz, William; Solar, Ronald J.; and Lieber, Clement, 4,430,083, Cl. 604-283.000.
Solver, Carl E.: *See*—
Berg, Samuel; and Solver, Carl E., 4,430,535, Cl. 200-82.00R.
Someshwar, Ashok H.; Lies, Kenneth A.; and Teza, Jeffrey R., to Texas Instruments Incorporated. Modular input/output system. 4,430,584, Cl. 307-465.000.
Sone, Kohki; and Kitahara, Thuyoshi, to Nissan Motor Co., Ltd. System for feedback control of air/fuel ratio in IC engine with means to control current supply to oxygen sensor. 4,430,191, Cl. 204-401.000.
Sonneborn, Lambertus J., to Applied Power Inc. Hydraulic control system having reciprocating pump and handle operated rotating valve. 4,429,529, Cl. 60-433.000.
Sorbe, Gunter; Wasel-Nielen, Horst-Dieter; and Kandler, Joachim, to Hoechst Aktiengesellschaft. Granulate consisting of hydrated sodium tripolyphosphate and water-insoluble alumino silicate ion exchanger material. 4,430,246, Cl. 252-140.000.
Sorensen, Kim: *See*—
Henrichsen, Frank; Hansen, Flemming; and Sorensen, Kim, 4,430,062, Cl. 433-28.000.
Sorensen, Roald H. Basketball goal. 4,430,130, Cl. 148-12.00B.
Sorenson, Paul D.; and Dickson, Dale A., to Medtronic, Inc. Ultrasonic transducer system with fluid applicator. 4,429,577, Cl. 73-644.000.
Sorenson, Richard W., to Carlingswitch, Inc. Switch construction. 4,430,534, Cl. 200-68.300.
Souno, Ryuichi: *See*—
Tamura, Tooru; Ojima, Nobuyuki; Mochizuki, Hideaki; Souno, Ryuichi; and Ikka, Toshifumi, 4,430,688, Cl. 361-307.000.
Southard, Albert A. Rotary steel filing apparatus for sharpening saw chains. 4,429,596, Cl. 76-36.000.
Spademan, Richard G. Step-in ski binding. 4,429,896, Cl. 280-624.000.
Spadotto, Oliviano; Roman, Gianfranco; and Da Rold, Claudio, to Claber S.p.A. Female element for quick-coupling connection for flexible pipes. 4,429,906, Cl. 285-315.000.
Spector, George: *See*—
Hill, Lee; and Spector, George, 4,429,460, Cl. 30-90.100.
Speet, Larry A.: *See*—
VandenHoek, Harold L.; Speet, Larry A.; and Mohr, Robert G., 4,429,934, Cl. 339-22.00R.
Spenceley, Gene D.; Davies, Mervyn W.; and Robson, Alan L., to British Steel Corporation. Production of steel. 4,430,117, Cl. 75-51.000.
Spencer Wright Industries, Inc.: *See*—
Slattery, Ian, 4,429,648, Cl. 112-79.00R.
Sperry Corporation: *See*—
Hermansdorfer, James E.; and Spurgin, William T., 4,430,640, Cl. 340-347.0SY.
Jillie, Don W., Jr.; and Smith, Lawrence N., 4,430,662, Cl. 357-5.000.
Rea, Clyde M., 4,430,691, Cl. 361-383.000.
Spica S.p.A.: *See*—
Roca-Nierga, Manuel, 4,429,672, Cl. 123-369.000.
Spieler, Wolfgang: *See*—
Honel, Hans; Michel, Walter; Piesch, Steffen; Schluter, Karin; Seidel, Manfred; and Spieler, Wolfgang, 4,430,380, Cl. 428-254.000.
Spielmann, Norbert, to FAG Kugelfischer Georg Schafer & Co. Master cylinder for brake or clutch. 4,429,531, Cl. 60-588.000.
Spiewok, Leonhard, to Escher Wyss Limited. Centrifuge sieve. 4,430,221, Cl. 210-380.100.
Sprague, Leland L. Blood infusion pump. 4,430,078, Cl. 604-141.000.
Sprecker, Mark A.; and Hall, John B., to International Flavors & Fragrances Inc. Substituted tricyclodecane derivatives, processes for producing same and organoleptic uses thereof. 4,430,508, Cl. 560-256.000.
Spring, Donald A.: *See*—
Dorros, Gerald; and Spring, Donald A., 4,429,724, Cl. 141-27.000.
Spurgin, William T.: *See*—
Hermansdorfer, James E.; and Spurgin, William T., 4,430,640, Cl. 340-347.0SY.
Spurrier, Francis R.; DeZubay, Egon A.; Murray, Alexander P.; and Vidt, Edward J., to United States of America, Energy. Slab reformer. 4,430,304, Cl. 422-204.000.

Stack, Eugene V., to Dow Chemical Company, The. Method for the extrusion of tetrafluoroethylene polymer tubes. 4,430,282, Cl. 264-127.000.

Stack, Eugene V.: *See*—
Burnett, Edward L.; and Stack, Eugene V., 4,430,283, Cl. 264-127.000.

Stadelhofer, Jurgen; and Franck, Heinz-Gerhard, to Rutgerswerke Aktiengesellschaft. Process for dissolving coal in hydrocarbon mixtures. 4,430,193, Cl. 208-8.0LE.

Staerzl, Richard E., to Brunswick Corporation. Programmed cold start enrichment circuit for a fuel injected internal combustion engine. 4,429,673, Cl. 123-491.000.

Stahl, Fritz; and Steffen, Horst, to Kollmorgen Technologies Corporation. Method of producing printed circuit boards. 4,430,154, Cl. 156-651.000.

Stamicarbon B.V.: *See*—
Smith, Paul; and Lemstra, Pieter J., 4,430,383, Cl. 428-364.000.

Standard Car Truck Company: *See*—
Powell, Patrick L., 4,430,561, Cl. 235-95.00B.

Standard Oil Company, (Indiana): *See*—
Oltrogge, Robert D., 4,430,195, Cl. 208-8.00R.
Reed, Robert L.; Petty, Luther E.; and Goddin, Clifton S., Jr., 4,430,317, Cl. 423-574.00R.
Walker, Donald C.; and Wagner, Theodore O., 4,429,725, Cl. 141-59.000.

Stanley Aviation Corporation: *See*—
Valentine, Gordon A., 4,429,905, Cl. 285-93.000.

Stanley Works, The: *See*—
Rutty, Edward C.; and Stoutenberg, Carl C., 4,429,462, Cl. 33-138.000.

Stanton, Robert. Golf club. 4,429,875, Cl. 273-81.200.

Stanton, Robert. Golf putting target. 4,429,882, Cl. 273-177.00R.

State of South Dakota as represented by the Department of Transportation: *See*—
Sandvig, Robert L.; Klemm, William A.; Gaines, Jack R.; and Looyenga, Robert W., 4,430,240, Cl. 252-70.000.

State University of New York: *See*—
Blau, Monte; Kung, Hank F.; and Tramposch, Kenneth M., 4,430,319, Cl. 424-1.100.

Statkus, Frank D.: *See*—
Brown, Stephen T.; and Statkus, Frank D., 4,429,844, Cl. 244-219.000.

Steelcase Inc.: *See*—
VandenHoek, Harold L.; Speet, Larry A.; and Mohr, Robert G., 4,429,934, Cl. 339-22.00R.

Stefancich, Kenneth G., to Mardan Corp. Musical instrument support. 4,430,017, Cl. 403-104.000.

Stefanidakis, George: *See*—
Aiello, Robert P.; Stefanidakis, George; and Poling, Dwayne E., 4,430,204, Cl. 208-240.000.

Steffen, Horst: *See*—
Stahl, Fritz; and Steffen, Horst, 4,430,154, Cl. 156-651.000.

Steger, Jay D.; Neitzke, Thomas G.; and Gagnon, Stephen J. Unitized packaging arrangement. 4,429,794, Cl. 206-597.000.

Steil, Emeram: *See*—
Brugger, Inge; and Steil, Emeram, 4,429,835, Cl. 239-338.000.

Stein, Edward I.: *See*—
Deering, Dana F.; and Stein, Edward I., 4,430,461, Cl. 523-340.000.

Steinberg, Alfred, to Ocean & Atmospheric Science, Inc. Solar heating system. 4,429,545, Cl. 62-235.100.

Steinbrecher, Marc L.: *See*—
Chang, Jack P.; and Steinbrecher, Marc L., 4,429,987, Cl. 355-14.0FU.

Steinbruegge, Harold A.; and Der, Chuck F., to Westinghouse Electric Corp. Method and apparatus for starting a parallel-tuned current fed inverter. 4,430,697, Cl. 363-49.000.

Steiner Corporation: *See*—
Steiner, Robert L.; and Smith, Randel P., 4,429,812, Cl. 222-181.000.

Steiner, Jean-Pierre; Melin, Christiane; Platon, Jean-Francois; and Petos, Nicole, to Lesieur-Cotelle & Associes. Concentrated softening composition for textile fibers. 4,429,859, Cl. 252-8.800.

Steiner, Robert L.; and Smith, Randel P., to Steiner Corporation. Soap dispensing system. 4,429,812, Cl. 222-181.000.

Steinfelder, Karl; Heisig, Ullrich; Schiller, Siegfried; Mehr, Dietrich; Thusse, Bernd; and Hielscher, Klaus, to VEB Elektronik Gera. Trim condenser. 4,430,687, Cl. 361-293.000.

Steketee, Campbell H., Jr.: *See*—
Beck, Richard D.; and Steketee, Campbell H., Jr., 4,429,720, Cl. 138-97.000.

Stepien, Michael A.: *See*—
Milleker, William W.; Freeburg, Thomas A.; and Stepien, Michael A., 4,430,742, Cl. 375-5.000.

Stepp, J. Fred. Portable tube holder. 4,429,929, Cl. 312-107.000.

Stern, Kurt H., to United States of America, Navy. Electrodeposition of refractory metal carbides. 4,430,170, Cl. 204-39.000.

Stevenson, Thomas E., to Babcock & Wilcox Company, The. Valve operator. 4,429,592, Cl. 74-625.000.

Stocker, Raymond, to Ford Motor Company. Dual ratio accelerator pedal assembly. 4,429,589, Cl. 74-513.000.

Stockmaster, Edward F., to Babcock & Wilcox Company, The. Circuit board module mounting unit. 4,429,937, Cl. 339-65.000.

Stokes, Ian D., to Marshall-Fowler Limited. Electrode steam boiler and method of operation thereof. 4,430,555, Cl. 219-286.000.

Stol, Israel, to Invocas, Inc. Ultrasonic excitation of underwater torpedoes for enhancing maneuverability, speed and targeting accuracy. 4,429,652, Cl. 114-20.00R.

Storage Technology Corporation: *See*—
Coulson, Richard L.; Blickenstaff, Ronald L.; Dodd, P. David; Moreno, Robert J.; and Kinard, Dean P., 4,430,712, Cl. 364-300.000.

Stoudt, Thomas H.; and Nollstadt, Karl H., to Merck & Co., Inc. Modified glucans as anti-caries agent and method of use. 4,430,322, Cl. 424-49.000.

Stoutenberg, Carl C.: *See*—
Rutty, Edward C.; and Stoutenberg, Carl C., 4,429,462, Cl. 33-138.000.

Stover, John C.; and Borkoski, Paul J., to Emerson Electric Co. Rail track heaters. 4,429,845, Cl. 246-428.000.

Strand, Jerome E.: *See*—
Thill, Gary A.; and Strand, Jerome E., 4,430,079, Cl. 604-154.000.

Streck, Clemens. Oxidation base dye composition and method of dyeing therewith. 4,430,091, Cl. 8-523.000.

Streeter, Bruce E.: *See*—
MacMillan John H.; Bertozzi, Eugene R.; and Streeter, Bruce E., 4,430,489, Cl. 528-45.000.

Streeter, Robert D., to Magnavox Consumer Electronics Company. Receiving apparatus for stereophonic broadcast having amplitude and angle modulated signal components. 4,430,747, Cl. 381-15.000.

Stringham, Roger S.: *See*—
Toy, Madeline S.; and Stringham, Roger S., 4,430,089, Cl. 8-115.500.

Stromberg-Carlson Corporation: *See*—
Kandell, Ronald J.; Merriam, Donald R.; Root, Bernard H.; and Woodruff, William W., 4,430,530, Cl. 179-175.20D.

Strueh, Timothy C., to TRW Inc. Fluid flow control. 4,429,708, Cl. 137-117.000.

Strupczewski, Joseph T.; and Gardner, Beth A., to Hoechst-Roussel Pharmaceuticals Inc. Substituted 1-azaspiro[4,5]decanes and their analgesic compositions. 4,430,335, Cl. 424-267.000.

Stubbs, John K.: *See*—
Campbell, Simon F.; Cross, Peter E.; and Stubbs, John K., 4,430,333, Cl. 424-266.000.

Stude, Rodney C. Diving spear. 4,429,480, Cl. 43-6.000.

Sturm, Ruger & Company, Inc.: *See*—
Ruger, William B., 4,429,617, Cl. 89-198.000.

Stuttgen, Friedel: *See*—
Ippen, Jakob; and Stuttgen, Friedel, 4,429,728, Cl. 152-209.00A.

Subtex, Inc.: *See*—
George, Stephen, 4,430,384, Cl. 428-377.000.

Suburban Duplicator Repair, Inc.: *See*—
Commers, Louis P., 4,429,631, Cl. 101-349.000.

Sueyoshi, Masahiko: *See*—
Onitsuka, Nobuyuki; Fukamachi, Masaaki; and Sueyoshi, Masahiko, 4,430,612, Cl. 324-166.000.

Sugie, Mamoru: *See*—
Toyooka, Takashi; Aoki, Hirokazu; Sugie, Mamoru; and Yoshizawa, Shigeru, 4,430,729, Cl. 365-6.000.

Sugimoto, Kazua: *See*—
Kiba, Akira; and Sugimoto, Kazua, 4,429,984, Cl. 355-3.0SH.

Sugiura, Yasuro: *See*—
Ishikawa, Hitoshi; Yamamoto, Kimihiko; and Sugiura, Yasuro, 4,429,650, Cl. 112-258.000.

Sugiyama, Michio. Semi-continuous vacuum heat-treating furnace, and its operation process. 4,430,055, Cl. 432-11.000.

Suierveld, John: *See*—
Schaible, Paul M.; and Suierveld, John, 4,430,365, Cl. 427-96.000.

Sullivan, Richard N. Closure plug assembly for pressure testing liquid drain and vent plumbing pipe systems. 4,429,568, Cl. 73-49.800.

Sullivan, Robert P., to Combustion Engineering, Inc. Submerged scraper conveyor furnace transition piece. 4,429,640, Cl. 110-165.00R.

Sullivan, Ronald E. Clothes drying structure. 4,429,928, Cl. 312-31.000.

Sulser, Ulrich: *See*—
Burge, Theodor A.; Widmer, Jurg; Meyer, Theodor; and Sulser, Ulrich, 4,430,469, Cl. 524-247.000.

Sulzer, Harry E., to Anchor/Darling Industries, Inc. Mechanical snubber apparatus. 4,429,563, Cl. 73-11.000.

Sumitomo Bakelite Company: *See*—
Ochi, Takashi; and Kaneko, Fumihiko, 4,430,142, Cl. 156-379.900.

Sumitomo Electric Industries, Ltd.: *See*—
Yoshida, Kenichi; Hiramoto, Junichi; and Takenaka, Shinya, 4,430,610, Cl. 324-51.000.

Sumitomo Special Metal Ltd.: *See*—
Wada, Toshiaki; Furukawa, Mitsuhiko; Miyahara, Michito; Shiroyama, Masaharu; Misumi, Kiyohito; and Kitahira, Takashi, 4,430,440, Cl. 501-105.000.

Sunagawa, Hiroshi: *See*—
Ono, Yoshihiro; and Sunagawa, Hiroshi, 4,430,405, Cl. 430-95.000.

Sunayama, Takayoshi: *See*—
Matsuoka, Chikara; Sawada, Kouzi; and Sunayama, Takayoshi, 4,430,016, Cl. 403-40.000.

Suncor, Inc.: *See*—
Morgan, George W.; and Wetzel, Vernon F., 4,429,653, Cl. 114-42.000.

Sundermann, Rudolf: *See*—
Heitkamper, Peter; Konig, Klaus; Findeisen, Kurt; Fauss, Rudolf; and Sundermann, Rudolf, 4,430,505, Cl. 560-24.000.

Sung-shan, Peng. Toothbrush. 4,429,434, Cl. 15-341.000.

Sunny Co., Ltd.: *See*—
Kawabata, Akira, 4,429,927, Cl. 308-236.000.

Sunpower, Inc.: *See*—
Beale, William T., 4,429,530, Cl. 60-520.000.

Surace, Filippo; and Garcea, Giampaolo, to Alfa Romeo Auto S.p.A. Motor vehicle having an internal-combustion engine fitted with means for controlling the air stream flowing through the engine compartment. 4,429,666, Cl. 123-41.050.

Surace, Filippo, to Alfa Romeo S.p.A. Device for automatically adjusting the rotational speed of an internal combustion engine when operating under idling conditions. 4,429,671, Cl. 123-339.000.

Surek, Thomas: *See*—
Kaleja, Juris P.; Chalmers, Bruce; and Surek, Thomas, 4,430,305, Cl. 422-246.000.

Sussman, Howard. Interconnected one-piece desk unit. 4,429,796, Cl. 211-11.000.

Susumago, Hiroshi: *See*—
Higuchi, Terumasa; and Susumago, Hiroshi, 4,430,162, Cl. 203-37.000.

Sutoh, Shinji: *See*—
Hara, Toshizo; Sutoh, Shinji; and Kojima, Toshio, 4,429,733, Cl. 165-16.000.

Sutton, Arthur J.: *See*—
Moore, Brian B.; Rodell, John T.; Sutton, Arthur J.; and Vowell, Jeff D., 4,430,727, Cl. 364-900.000.

Suzuki, Akiko: *See*—
Shigematsu, Akiyo; Tsuya, Akira; Aihara, Michiaki; Suzuki, Akiko; and Matsuda, Michiko, 4,430,320, Cl. 424-1.100.

Suzuki, Katsuhito: *See*—
Hosoya, Akira; Tamahashi, Kunihiro; Onuma, Shigeharu; Kakuta, Atsushi; Mori, Yasuki; Suzuki, Katsuhito; and Morishita, Hirosada, 4,430,404, Cl. 430-58.000.

Suzuki, Keizo; Okudaira, Sadayuki; Nishimatsu, Shigeru; and Kanomata, Ichiro, to Hitachi, Ltd. Microwave plasma etching apparatus having fan-shaped discharge. 4,430,138, Cl. 156-345.000.

Suzuki, Masakazu; Ikeda, Toshiaki; and Furuichi, Shuhei, to Kabushiki Kaisha Morita Seisakusho. Tomograph for photographing entire jaws. 4,430,746, Cl. 378-40.000.

Suzuki, Mikio; and Yamazaki, Masafumi, to Nissan Motor Company, Limited. Carburetor and method for an internal combustion engine. 4,430,274, Cl. 261-18.00B.

Suzuki, Nobuyuki, to Canon Kabushiki Kaisha. Power supply device for camera. 4,429,974, Cl. 354-484.000.

Suzuki, Yukio; and Kobayashi, Syozo, to Tokyo Shibaura Denki Kabushiki Kaisha. High-frequency heating device. 4,430,538, Cl. 219-10.55F.

Suzuki, Yukio, to Tokyo Shibaura Denki Kabushiki Kaisha. High-frequency heating device. 4,430,539, Cl. 219-10.55F.

Swanson, Jerome E., to Minnesota Mining & Manufacturing Company. Image stabilizers for vesicular film. 4,430,414, Cl. 430-176.000.

Swart, Gerald W.: *See*—
Bemis, Peter F.; and Swart, Gerald W., 4,430,073, Cl. 604-48.000.

Swartz, Raymond K.: *See*—
Dillow, Harry M.; Sansone, Anthony E.; and Swartz, Raymond K., 4,430,385, Cl. 428-380.000.

Sweeney, William M.: *See*—
Jenkins, Robert H., Jr.; and Sweeney, William M., 4,430,093, Cl. 44-70.000.

Swiss Aluminium Ltd.: *See*—
Snaeland, Sveinn; Halldorsson, Ragnar; Franke, Alwis; and Gudmundsson, Einar, 4,430,187, Cl. 204-243.00R.

Syntex (U.S.A.) Inc.: *See*—
Alsup, James D., Jr.; Barrett, Kenneth L.; and Jenkins, Arden F., 4,429,918, Cl. 297-353.000.

Synthelabo: *See*—
Wick, Alexander E.; and Frost, Jonathan R., 4,430,334, Cl. 424-267.000.

Syrbius, Gerhard: *See*—
Koch, Klaus; and Syrbius, Gerhard, 4,429,628, Cl. 100-117.000.

Syrenne, Marius H. Combination water saver and disinfectant dispenser. 4,429,423, Cl. 4-225.000.

Szakvary, Laszlo, to Elphora. Radioelectric signal trains generator and portable transmitter comprising such a generator. 4,430,757, Cl. 455-100.000.

Tabata, Norikazu: *See*—
Namba, Keisuke; Tanaka, Masaaki; Ueno, Takanori; and Tabata, Norikazu, 4,430,306, Cl. 422-292.000.

Tabuchi, Takeo: *See*—
Miyafuji, Motohisa; Matsui, Takashi; Harada, Hidekazu; Soeda, Masumitsu; Ishikawa, Shin; Murakado, Hiroshi; Kawamoto, Hiroaki; Tabuchi, Takeo; Kamada, Kunio; and Nakashima, Yasuhiro, 4,430,298, Cl. 420-481.000.

Tada, Keishi: *See*—
Miyake, Tetsuya; Takeda, Kunihiko; and Tada, Keishi, 4,430,445, Cl. 521-38.000.

Tagai, Hideo: *See*—
Niwa, Shigeo; Sawai, Kazuhiko; Takahashi, Shinobu; Tagai, Hideo; Ono, Mikiya; Fukuda, Yoshiaki; and Takeuchi, Hiroyasu, 4,429,691, Cl. 128-92.00C.

Taguchi, Shinichiro; Nagao, Nobuya; and Ogihara, Yutaka, to Tokyo Shibaura Denki Kabushiki Kaisha. Color video signal processing circuit. 4,430,674, Cl. 358-317.000.

Taguchi, Tetsuya: *See*—
Yamamichi, Masayoshi; Iura, Yukio; Aizawa, Hiroshi; Ito, Tadashi; Taguchi, Tetsuya; and Uchidoi, Tadanori, 4,429,972, Cl. 354-448.000.

Taig, Alistair G., to Bendix Corporation, The. Automatic locking and adjustment assembly. 4,429,777, Cl. 192-111.00A.

Tajima, Ikuo, to Tokai Kogyo Mishin Kabushiki Kaisha. Device for detecting absence of a thread in a sewing machine. 4,429,651, Cl. 112-273.000.

Taka, Hideo; and Masunaga, Makoto, to Canon Kabushiki Kaisha. Automatic focus control device. 4,429,968, Cl. 354-403.000.

Takada, Takashi: *See*—
Sauer, Hans; Takada, Takashi; and Kondo, Yukihiro, 4,430,537, Cl. 200-302.100.

Takahashi, Shinobu: *See*—
Niwa, Shigeo; Sawai, Kazuhiko; Takahashi, Shinobu; Tagai, Hideo; Ono, Mikiya; Fukuda, Yoshiaki; and Takeuchi, Hiroyasu, 4,429,691, Cl. 128-92.00C.

Takahashi, Susumu: *See*—
Fukuzawa, Tadashi; Nakamura, Michiharu; and Takahashi, Susumu, 4,430,741, Cl. 372-46.000.

Takahashi, Tohru: *See*—
Tamura, Yasuyuki; Kiuchi, Masashi; Takahashi, Tohru; Mitsuhashi, Yasuo; and Tomari, Seiji, 4,430,411, Cl. 430-122.000.

Takamatsu, Akira; and Higuchi, Hiroshi, to Kabushiki Kaisha Mitsui Miike Seisakusho. Aeration tank for activated-sludge process sewage treatment. 4,430,225, Cl. 210-608.000.

Takasaki, Mitsuhiro: *See*—
Murakami, Hiroya; Takasaki, Mitsuhiro; Yamada, Osamu; Kamada, Atsuya; and Hori, Katsuyoshi, 4,429,558, Cl. 72-17.000.

Takasaki, Yukio: *See*—
Shimomoto, Yasuharu; Tsukada, Toshihisa; Sasano, Akira; Tanaka, Yasuo; Yamamoto, Hideaki; and Takasaki, Yukio, 4,430,185, Cl. 204-192.00P.

Takauji, Kiyomi, to Kabushiki Kaisha Kawai Gakki Seisakusho. Electronic musical instrument. 4,429,605, Cl. 84-1.170.

Takeda Chemical Industries, Ltd.: *See*—
Yamamura, Yuichi; Ichiro, Azuma; and Kobayashi, Shigeru, 4,430,265, Cl. 260-112.50R.

Takeda, Hisashi: *See*—
Tsuchiya, Toshio; Moriizumi, Syuichi; Takeda, Hisashi; and Aria, Akinori, 4,430,136, Cl. 156-246.000.

Takeda, Kunihiko: *See*—
Miyake, Tetsuya; Takeda, Kunihiko; and Tada, Keishi, 4,430,445, Cl. 521-38.000.

Takenaka, Shinya: *See*—
Yoshida, Kenichi; Hiramoto, Junichi; and Takenaka, Shinya, 4,430,610, Cl. 324-51.000.

Takenouchi, Masanori: *See*—
Matsumoto, Toru; and Takenouchi, Masanori, 4,430,409, Cl. 430-106.600.

Takeshima, Kiyoshi; and Masuda, Yoshinori, to Yoshida Kogyo K. K. Slide fastener stringer. 4,429,438, Cl. 24-401.000.

Takeuchi, Hiroyasu: *See*—
Niwa, Shigeo; Sawai, Kazuhiko; Takahashi, Shinobu; Tagai, Hideo; Ono, Mikiya; Fukuda, Yoshiaki; and Takeuchi, Hiroyasu, 4,429,691, Cl. 128-92.00C.

Takeuchi, Tomio: *See*—
Umezawa, Hamao; Takeuchi, Tomio; Kondo, Shinichi; Iinuma, Hironobu; Ikeda, Daishiro; Nakamura, Teruya; and Fujii, Akio, 4,430,346, Cl. 424-311.000.

Taki, Yoshihiro: *See*—
Miyakawa, Susumu; Fukuta, Toshiaki; Akado, Hajime; and Taki, Yoshihiro, 4,430,223, Cl. 210-493.500.

Takigawa, Tadahiro; and Sasaki, Isao, to Tokyo Shibaura Denki Kabushiki Kaisha. Electron beam exposing apparatus. 4,430,570, Cl. 250-423.00R.

Takimoto, Yukio: *See*—
Saga, Ryokichi; and Takimoto, Yukio, 4,430,732, Cl. 370-54.000.

Talbert, William L., to Onics, Inc. Fuel system for internal combustion engines. 4,429,675, Cl. 123-558.000.

Tamahashi, Kunihiro: *See*—
Hosoya, Akira; Tamahashi, Kunihiro; Onuma, Shigeharu; Kakuta, Atsushi; Mori, Yasuki; Suzuki, Katsuhito; and Morishita, Hirosada, 4,430,404, Cl. 430-58.000.

Tamaki, Kazuyoshi: *See*—
Mitsueda, Hisami; Tamaki, Kazuyoshi; and Ariyoshi, Hiromi, 4,430,618, Cl. 328-149.000.

Tamaki, Kiyoshi: *See*—
Koyama, Mikio; Kikugawa, Shozo; Okaniwa, Kenichiro; and Tamaki, Kiyoshi, 4,430,436, Cl. 436-531.000.

Tamary, Ernest J., to Eastman Kodak Company. Apparatus for controlling the application of fuser release material in roller fusers. 4,429,990, Cl. 355-14.0FU.

Tamer, Gregory G., to RCA Corporation. Television channel indicator with automatic on-screen display. 4,430,671, Cl. 358-192.100.

Tamura, Morio: *See*—
Kamejima, Kohji; Hibino, Yozo; Ooizumi, Junichi; Tanaka, Hideki; and Tamura, Morio, 4,429,541, Cl. 62-201.000.

Tamura, Shuichi: *See*—
Tokuda, Ryuji; Ogawa, Masahiko; Tsunekawa, Tokuichi; and Tamura, Shuichi, 4,429,967, Cl. 354-403.000.

Tamura, Tooru; Ojima, Nobuyuki; Mochizuki, Hideaki; Souno, Ryuichi; and Ikka, Toshifumi, to Matsushita Electric Industrial Co., Ltd. Small heat resistant film condenser. 4,430,688, Cl. 361-307.000.

Tamura, Yasuyuki; Kiuchi, Masashi; Takahashi, Tohru; Mitsuhashi, Yasuo; and Tomari, Seiji, to Canon Kabushiki Kaisha. Developing method for electrostatic image. 4,430,411, Cl. 430-122.000.

Tamura, Zensuke: *See—*
Sato, Isao; Ishibashi, Yohji; Minakawa, Yoshimitsu; Ohmori, Takashi; Tamura, Zensuke; Uchiyama, Yoshihiro; and Ohshima, Ryoichiro, 4,429,538, Cl. 60-748.000.

Tanaka, Hideki: *See—*
Kamejima, Kohji; Hibino, Yozo; Ooizumi, Junichi; Tanaka, Hideki; and Tamura, Morio, 4,429,541, Cl. 62-201.000.

Tanaka, Kazuyuki, to Central Glass Company, Limited. Sheet glass producing apparatus. 4,430,112, Cl. 65-335.000.

Tanaka, Masaaki: *See—*
Namba, Keisuke; Tanaka, Masaaki; Ueno, Takanori; and Tabata, Norikazu, 4,430,306, Cl. 422-292.000.

Tanaka, Seiji: *See—*
Kondo, Shigeki; Yamazaki, Yoshio; Iketani, Tomofumi; Tanaka, Seiji; and Doi, Keiichiro, 4,430,542, Cl. 219-10.770.

Tanaka, Tutomu: *See—*
Kuzumoto, Hideshi; Tanaka, Tutomu; and Matsumoto, Hiroshi, 4,430,219, Cl. 210-321.300.

Tanaka, Yasuo: *See—*
Shimomoto, Yasuharu; Tsukada, Toshihisa; Sasano, Akira; Tanaka, Yasuo; Yamamoto, Hideaki; and Takasaki, Yukio, 4,430,185, Cl. 204-192.00P.

Tang, Phillip H., to Amtel, Inc. Single leg terminal. 4,429,655, Cl. 114-230.000.

Taniguchi, Seiho; Sakuma, Yuichiro; and Yoshii, Tadashi, to Nippon Unicar Company Ltd. Flame retardant additives based on alumina trihydrate and ethylene polymer compositions, containing same, having improved flame retardant properties. 4,430,470, Cl. 524-269.000.

Taniguchi, Yoshio: *See—*
Nakano, Toshio; Taniguchi, Yoshio; Tsutsui, Ken; Sasano, Akira; Kaneko, Tadeo; Izumi, Akiya; and Hashimoto, Michiaki, 4,430,400, Cl. 430-7.000.

Tanikawa, Kunihiro; Ito, Yuichiro; and Ishii, Mitsuo. Semiconductor matrix operation device. 4,430,723, Cl. 364-862.000.

Tano, Masahiro: *See—*
Nomaguchi, Tamotsu; Tano, Masahiro; Fukuda, Mitsuo; and Saitou, Tatsuo, 4,429,735, Cl. 165-60.000.

Tape Research, Inc.: *See—*
Manktelow, Peter, 4,430,592, Cl. 310-93.000.

Taradalsky, Morris: *See—*
Cannavino, James A.; Heller, Andrew R.; Taradalsky, Morris; and Worley, William S., Jr., 4,430,705, Cl. 364-200.000.

Taragna, Luigi, to American Flange & Manufacturing Co. Inc. Tear-off cap for closing bottles. 4,429,801, Cl. 215-254.000.

Tarumi, Noriyoshi; Matsunawa, Masahiko; and Tokunaga, Hiroshi, to Konishiroku Photo Industry Co., Ltd. Method and apparatus for image reproduction. 4,430,661, Cl. 346-153.100.

Tarumi, Noriyoshi: *See—*
Miwa, Tadashi; Kimura, Kiyoshi; Komiya, Yukiharu; and Tarumi, Noriyoshi, 4,430,412, Cl. 430-126.000.

Tayler, Gerald E.: *See—*
Christian, John H.; Hartung, Michael H.; Nolta, Arthur H.; Reed, David G.; Rieck, Richard E.; Tayler, Gerald E.; and Williams, John S., 4,430,701, Cl. 364-200.000.

Taylor Box Co.: *See—*
Shedd, David E., 4,429,826, Cl. 229-23.0BT.

Taylor, Donald F., to Sedco, Inc. Pressure responsive actuator for use with an automatic dump valve. 4,429,622, Cl. 92-93.000.

Taylor, Elizabeth C. Method of mitering mold and the like. 4,429,601, Cl. 83-13.000.

Taylor, Ottilia Z.; and Lazar, Janos J., to Injection Mold Partners, Ltd. Ball whirling toy and method of exercise using said toy. 4,429,487, Cl. 46-43.000.

Taylor, William E.: *See—*
Loganbill, Ernest L.; and Taylor, William E., 4,430,604, Cl. 318-379.000.

Tayo Boseki Kabushiki Kaisha: *See—*
Kuzumoto, Hideshi; Tanaka, Tutomu; and Matsumoto, Hiroshi, 4,430,219, Cl. 210-321.300.

Technical and Safety Consultants, Inc.: *See—*
Houck, Timothy B., 4,429,763, Cl. 182-2.000.

Technicraft, Inc.: *See—*
Fischer, Carlin P., 4,430,018, Cl. 403-268.000.

Tedder, Daniel W., to Georgia Tech Research Institute. Fractional distillation of C_2/C_3 hydrocarbons at optimum pressures. 4,430,102, Cl. 62-24.000.

Teets, J. Michael. Turbine engine with combustor premix system. 4,429,527, Cl. 60-39.060.

Tektronix, Inc.: *See—*
Baur, Bruce K.; and Ollis, John R., 4,430,641, Cl. 340-347.0DA.

Telectronics Pty. Ltd.: *See—*
Nappholz, Tibor A.; Bradbury, Ronald C.; and Satchwell, Bruce R., 4,429,697, Cl. 128-419.0PG.

TELEFUNKEN electronic GmbH: *See—*
Kuhlmann, Joachim, 4,430,617, Cl. 328-61.000.

Tennyson, Mark R., to Rockwell International Corporation. MOS Fixed delay circuit. 4,430,587, Cl. 307-590.000.

Terabe, Mahito: *See—*
Momose, Haruo; Ishida, Masaaki; and Terabe, Mahito, 4,430,430, Cl. 435-114.000.

Terada, Katumi, to Olympus Optical Company Ltd. Photographing data indicator for a single lens reflex camera. 4,429,979, Cl. 354-289.100.

Teramoto, Hirokazu, to Uryu Seisaku, Ltd. Clutch type torque control device for air driver. 4,429,775, Cl. 192-0.096.

Termolar S/A: *See—*
De Freitas, Elias M., 4,429,813, Cl. 222-207.000.

Terry, Clifford M.: *See—*
Mocilac, Joseph P.; Terry, Clifford M.; and Mesaros, John G., 4,429,960, Cl. 351-212.000.

Ternteegen, Bernd; and Van Endert, Gunter. Adapter. 4,429,852, Cl. 251-9.000.

Testa, Rene B.; and Boctor, Wassief M., to Testa, Rene B. Stress transducer for fabrics and flexible sheet materials. 4,429,580, Cl. 73-768.000.

Tetra Pak Developpement SA: *See—*
Olofsson, Bo H. O., 4,430,543, Cl. 219-10.790.

Tetra Pak International AB: *See—*
Pupp, Herwig; Andersson, Otto B.; and Nilsson, Jan-Erik, 4,430,140, Cl. 156-356.000.

Texaco Development Corp.: *See—*
Hunter, Walter D., 4,430,481, Cl. 525-328.400.
Hunter, Walter D., 4,430,482, Cl. 525-329.400.

Texaco, Inc.: *See—*
Castagnos, Leonce F., Jr.; and Pratt, Roy E., 4,430,201, Cl. 208-164.000.
Jenkins, Robert H., Jr.; and Sweeney, William M., 4,430,093, Cl. 44-70.000.

Texas Instruments Incorporated: *See—*
Hamilton, Stephen P.; Hunter, Arthur C.; and Lies, Kenneth A., 4,430,724, Cl. 364-900.000.
Levine, Jules D.; McKee, William R.; and Carson, Kent R., 4,430,150, Cl. 156-616.00A.
Scalf, Gerald W., 4,430,540, Cl. 219-10.55B.
Someshwar, Ashok H.; Lies, Kenneth A.; and Teza, Jeffrey R., 4,430,584, Cl. 307-465.000.

Texize, Division of MortonThiokol: *See—*
Franks, T. Chandler, 4,430,236, Cl. 252-95.000.

Teza, Jeffrey R.: *See—*
Someshwar, Ashok H.; Lies, Kenneth A.; and Teza, Jeffrey R., 4,430,584, Cl. 307-465.000.

Thaler, Arnold: *See—*
Friedson, Belvin F.; Thaler, Arnold; and Saud, Ivan, 4,429,687, Cl. 128-24.200.

Thees, Richard; and Wilden, Rolf, to Honeywell B.V. Blood pressure measuring device. 4,429,700, Cl. 128-681.000.

Theisen, Peter J.: *See—*
Forsell, Kenneth A.; Grass, William E.; Theisen, Peter J.; and Fajner, Michael J., 4,430,631, Cl. 335-16.000.

Thill, Gary A.; and Strand, Jerome E., to Minnesota Mining and Manufacturing Company. Fluid dispensing device. 4,430,079, Cl. 604-154.000.

Thimon, Jacques, to S.A. Thimon. Device for shaping a film of heat-retractable plastics material. 4,429,510, Cl. 53-167.000.

Thiokol Corporation: *See—*
Byrd, James D.; and Hightower, James O., 4,429,634, Cl. 102-290.000.
MacMillan John H.; Bertozzi, Eugene R.; and Streeter, Bruce E., 4,430,489, Cl. 528-45.000.

Tholema, Edzard: *See—*
Casper, Clemens; Grenner, Dieter; Klette, Gerd-Rudiger; and Tholema, Edzard, 4,430,156, Cl. 159-47.100.

Thomas & Betts Corporation: *See—*
Piasecki, Raymond F., 4,429,939, Cl. 339-97.00C.

Thomas, Brian J., to Lucas Industries Limited. Method of producing a lead-acid battery utilizing vibrational energy. 4,429,442, Cl. 29-2.000.

Thomas J. Lipton, Inc.: *See—*
Tresser, David, 4,430,350, Cl. 426-101.000.

Thomas, Lothar, to Deutsche Babcock Anlagen Aktiengesellschaft. Fluidized bed firing system. 4,429,644, Cl. 110-245.000.

Thompson, Donald R.: *See—*
Bryant, David M.; Corbeil, Ryn C.; Malcolm, Michael A.; Rogers, Lawrence D.; and Thompson, Donald R., 4,430,651, Cl. 340-825.520.

Thompson, Roger A. Counter-rotating vortices generator for an aircraft wing. 4,429,843, Cl. 244-199.000.

Thompson, William E. Ambient pressure lamp. 4,430,597, Cl. 313-113.000.

Thompson, William L., to Babcock & Wilcox Company, The. Vortex shedding flowmeter circuit with analog and pulse output signal. 4,429,582, Cl. 73-861.220.

Thomson CSF: *See—*
Berger, Jean Luc, 4,430,672, Cl. 358-213.000.
Bert, Alain; and Kaminsky, Didier, 4,430,623, Cl. 330-286.000.
Billard, Jean; Dubois, Jean-Claude; Hareng, Michel; Le Berre, Serge; and Perbet, Jean-Noel, 4,430,650, Cl. 340-784.000.
Nuyen, Trong L.; and de Cremoux, Baudouin, 4,430,740, Cl. 372-45.000.

Thorne, Edward J.: *See—*
Pytlewski, Louis J.; and Thorne, Edward J., 4,430,208, Cl. 208-262.000.

Thrower, Anthony, to USS Engineers and Consultants, Inc. Union for providing inert gas between teeming nozzle and pouring tube. 4,429,816, Cl. 222-603.000.

Thusse, Bernd: *See—*
Steinfelder, Karl; Heisig, Ullrich; Schiller, Siegfried; Mehr, Dietrich; Thusse, Bernd; and Hielscher, Klaus, 4,430,687, Cl. 361-293.000.

Thyssen Industrie AG Henschel: *See—*
Grosser, Heinrich, 4,429,616, Cl. 89-36.00K.

TI Russell Hobbs Limited: *See*—
Inskip, Michael; and Warren, Alan, 4,430,556, Cl. 219-328.000.
Tibbetts, George C.; and Sawyer, Joseph A., to Tibbetts Industries, Inc. Transducer shielding enclosure. 4,430,520, Cl. 174-35.00R.
Tibbetts Industries, Inc.: *See*—
Tibbetts, George C.; and Sawyer, Joseph A., 4,430,520, Cl. 174-35.00R.
Tice, Bernard O.; and Bailey, Gene E., to Ditcher Saw Company. Portable ditcher and excavating elements therefor. 4,429,477, Cl. 37-80.00R.
Tidman, Derek A.; and Goldstein, Shyke A., to GT - Devices. Method and apparatus for accelerating a solid mass. 4,429,612, Cl. 89-8.000.
Tien, Paul C., to International Business Machines Corporation. FET Memory with refresh. 4,430,730, Cl. 365-149.000.
Tighe, Brian J.; and Gee, Howard J., to Kelvin Lenses Limited. Hydrogel-forming polymeric materials. 4,430,458, Cl. 523-108.000.
Tilgner, Peter J., to Upjohn Company, The. Reaction injection molding of nylon. 4,430,287, Cl. 264-40.600.
Timmermans, Hans A., to Cook, Inc. Hemostasis sheath. 4,430,081, Cl. 604-256.000.
Timmons, Fred A. Pipe coupler. 4,429,907, Cl. 285-373.000.
Tinder, David V., to Essex Group, Inc. Injection timing transducer. 4,429,570, Cl. 73-119.00A.
Tobita, Yuichi: *See*—
Yanagisawa, Syozo; and Tobita, Yuichi, 4,430,099, Cl. 55-316.000.
Tocco, Charles T. Slip on compensator for revolvers. 4,429,614, Cl. 89-14.00C.
Toda, Kazuo: *See*—
Ihara, Keisuke; Toda, Kazuo; and Hoshino, Shozi, 4,429,626, Cl. 99-510.000.
Togashi, Seigo; and Tsuzuki, Akira, to Citizen Watch Company Limited. Combination matrix array display and memory system. 4,430,648, Cl. 340-718.000.
Tokai Electric Wire Company Limited: *See*—
Inoue, Nori, 4,429,943, Cl. 339-198.00R.
Tokai Kogyo Mishin Kabushiki Kaisha: *See*—
Tajima, Ikuo, 4,429,651, Cl. 112-273.000.
Tokico Ltd.: *See*—
Oshima, Harumi; and Uno, Tukasa, 4,429,769, Cl. 188-73.310.
Toko Kabushiki Kaisha: *See*—
Nakasone, Hiroyuki; and Sakamoto, Takayasu, 4,430,595, Cl. 310-339.000.
Tokuda, Ryuji; Ogawa, Masahiko; Tsunekawa, Tokuichi; and Tamura, Shuichi, to Canon Kabushiki Kaisha. Distance measuring system. 4,429,967, Cl. 354-403.000.
Tokunaga, Hiroshi: *See*—
Tarumi, Noriyoshi; Matsunawa, Masahiko; and Tokunaga, Hiroshi, 4,430,661, Cl. 346-153.100.
Tokyo Electric Co., Ltd.: *See*—
Ihara, Keisuke; Toda, Kazuo; and Hoshino, Shozi, 4,429,626, Cl. 99-510.000.
Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Hashizume, Kenichi, 4,429,662, Cl. 122-32.000.
Ikeda, Yoshio, 4,429,817, Cl. 222-652.000.
Koizumi, Hideo; Ishihara, Hideo; Matsumoto, Tatsuhiko; and Kawakita, Katsuhiko, 4,430,296, Cl. 420-429.000.
Shimada, Hirofumi; and Totsuka, Hisao, 4,430,292, Cl. 376-301.000.
Suzuki, Yukio; and Kobayashi, Syozo, 4,430,538, Cl. 219-10.55F.
Suzuki, Yukio, 4,430,539, Cl. 219-10.55F.
Taguchi, Shinichiro; Nagao, Nobuya; and Ogihara, Yutaka, 4,430,674, Cl. 358-317.000.
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Tomari, Seiji: *See*—
Tamura, Yasuyuki; Kiuchi, Masashi; Takahashi, Tohru; Mitsuhashi, Yasuo; and Tomari, Seiji, 4,430,411, Cl. 430-122.000.
Tomori, Yasumasa: *See*—
Kawasaki, Masahiro; Urano, Fumio; and Tomori, Yasumasa, 4,429,973, Cl. 354-455.000.
Tomoyori, Makoto: *See*—
Tsushima, Noboru; Tomoyori, Makoto; and Harumatsu, Masatoshi, 4,429,469, Cl. 33-361.000.
Toothill, Richard B.; Megna, Ignazio S.; and Chaudhuri, Ajit K., to American Cyanamid Company. Elastomers derived from thiodiethanol having reduced odor. 4,430,471, Cl. 524-356.000.
Toppan Printing Co., Ltd.: *See*—
Noguchi, Yoshiyasu; Yokokoji, Shoji; Saito, Shozo; and Hasegawa, Kiketsu, 4,429,457, Cl. 29-840.000.
Toray Industries, Inc.: *See*—
Kajita, Koji; Nakayama, Takashi; and Yamagata, Seiichi, 4,429,523, Cl. 57-328.000.
Torggler, Norbert: *See*—
Franz, Dietmar; and Torggler, Norbert, 4,430,525, Cl. 178-3.000.
Toth, Tibor E., to Union Carbide Corporation. Semi-automatic control and method for MIG welding. 4,430,551, Cl. 219-132.000.
Totsuka, Hisao: *See*—
Shimada, Hirofumi; and Totsuka, Hisao, 4,430,292, Cl. 376-301.000.
Toy, Madeline S.; and Stringham, Roger S., to Science Applications, Inc. Process for imparting flame retardancy to fabrics. 4,430,089, Cl. 8-115.500.
Toyo Kohan Co., Ltd.: *See*—
Watanabe, Tadao; Ohhori, Mitsuo; Ohta, Akio; and Kondo, Yoshikazu, 4,430,386, Cl. 428-555.000.
Toyo Seikan Kaisha, Ltd.: *See*—
Ito, Kazuo, 4,429,834, Cl. 239-327.000.
Toyoda Gosei Co., Ltd.: *See*—
Ezaki, Sazo, 4,430,374, Cl. 428-135.000.
Toyooka, Takashi; Aoki, Hirokazu; Sugie, Mamoru; and Yoshizawa, Shigeru, to Hitachi, Ltd. Series resonant drive circuit for magnetic bubble memory. 4,430,729, Cl. 365-6.000.
Toyoshima, Yukichi: *See*—
Hayakawa, Eizi; Kojima, Akio; Arai, Yoshi; Sakuma, Masatoshi; and Toyoshima, Yukichi, 4,430,379, Cl. 428-216.000.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See*—
Matsuoka, Chikara; Sawada, Kouzi; and Sunayama, Takayoshi, 4,430,016, Cl. 403-40.000.
Murata, Yoichi; Kishishita, Ryozo; and Nakata, Tadao, 4,429,467, Cl. 33-203.000.
Utsumi, Hiroo; Sakakibara, Yukio; Ito, Teruyoshi; Iwata, Toshiharu; Ohta, Jun; Kazi, Kiyokane; Hori, Osamu; and Banno, Mitsuyuki, 4,429,565, Cl. 73-35.000.
Tracey, Victor A., to Inco Europe Limited. Process for producing porous nickel bodies. 4,430,294, Cl. 419-2.000.
Tramposch, Kenneth M.: *See*—
Blau, Monte; Kung, Hank F.; and Tramposch, Kenneth M., 4,430,319, Cl. 424-1.100.
Transequip Limited: *See*—
Elston, Ronald W., 4,429,730, Cl. 160-368.00R.
Tremblay, Meude, to Canada, Her Majesty the Queen in right of. Polyurethane binders. 4,430,131, Cl. 149-19.400.
Tresser, David, to Thomas J. Lipton, Inc. Composite ice confections and processes for preparing them. 4,430,350, Cl. 426-101.000.
Trey, Karl: *See*—
Bork, Klaus; Humbs, Rolf; and Trey, Karl, 4,430,594, Cl. 310-328.000.
Trico Products Corporation: *See*—
Graczyk, Bronislaus S., 4,429,431, Cl. 15-250.320.
Triumph-Adler A.G. fur Buround Informationstechnik: *See*—
Fischer, Dieter, 4,430,564, Cl. 250-211.00R.
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Garland, Barbara R.; and Troutman, Mark D., 4,430,368, Cl. 427-385.500.
Trummlitz, Gunter; Seeger, Ernst; and Engel, Wolfhard, to Dr. Karl Thomae Gesellschaft mit beschrankter Haftung. Condensed isothiazolo-3 (2H)-one-1-1-dioxides. 4,430,355, Cl. 426-548.000.
Truth Incorporated: *See*—
Anderson, Donald L., 4,429,910, Cl. 292-199.000.
TRW Inc.: *See*—
Strueh, Timothy C., 4,429,708, Cl. 137-117.000.
Tsai, Kuo L., to Cathay Pen Corporation, a part interest. Ball point pen writing instrument. 4,430,014, Cl. 401-216.000.
Tsuchiya, Toshio; Morizumi, Syuichi; Takeda, Hisashi; and Aria, Akinori, to Lonseal Corporation. Process for preparing open-cell structure of vinyl chloride resin. 4,430,136, Cl. 156-246.000.
Tsuda, Hideaki: *See*—
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Tsuji, Hidekazu: *See*—
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Tsuji, Yasuhiro: *See*—
Watanabe, Mitsuo; Kimura, Shigeyuki; Konishi, Hideki; Tsuji, Yasuhiro; and Wakabayashi, Kiyoshige, 4,429,583, Cl. 73-864.120.
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Tsukada, Tsutomu, to Anelva Corporation. Method of monitoring status of a silicon layer by detecting, emission spectra variable during etching. 4,430,151, Cl. 156-626.000.
Tsukamoto, Goro: *See*—
Iemura, Ryuichi; Kawashima, Tsuneo; Fukuda, Toshikazu; Ito, Keizo; Nose, Takashi; and Tsukamoto, Goro, 4,430,343, Cl. 424-250.000.
Tsumura, Yoshishige, to Mitsui Aluminium Co., Ltd.; and Tsumura, Yoshishige. Method for refinement of impure aluminum. 4,430,174, Cl. 204-67.000.
Tsunekawa, Tokuichi: *See*—
Tokuda, Ryuji; Ogawa, Masahiko; Tsunekawa, Tokuichi; and Tamura, Shuichi, 4,429,967, Cl. 354-403.000.
Tsushima, Noboru; Tomoyori, Makoto; and Harumatsu, Masatoshi, to Alps Electric Co., Ltd. Direction detection apparatus. 4,429,469, Cl. 33-361.000.
Tsushima, Shuichi, to Ricoh Co., Ltd. Dichromatic electrophotography using two developer compositions applied sequentially. 4,430,402, Cl. 430-45.000.
Tsutsui, Ken: *See*—
Nakano, Toshio; Taniguchi, Yoshio; Tsutsui, Ken; Sasano, Akira; Kaneko, Tadeo; Izumi, Akiya; and Hashimoto, Michiaki, 4,430,400, Cl. 430-7.000.
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Togashi, Seigo; and Tsuzuki, Akira, 4,430,648, Cl. 340-718.000.
Tucker, Howard F. Reversible wrench. 4,429,598, Cl. 81-59.100.
Tufts, Timothy A.: *See*—
Culbertson, Billy M.; and Tufts, Timothy A., 4,430,491, Cl. 528-153.000.
Tuhro, Richard H.; and Wiggins, Douglas G., to Xerox Corporation. Image thresholding system. 4,430,748, Cl. 382-50.000.

Turk, Gunter: *See—*
Kreher, Alfons; Kuhner, Gerhard; Rothbuhr, Lothar; Turk, Gunter; and Wolff, Siegfried. 4,430,280, Cl. 264-117.000.

Turner, Andrew J., to Perkin-Elmer Limited. Concentration in time of a gas component entrained in a carrier gas. 4,429,736, Cl. 165-61.000.

Tuuha, Rolf, to Rauma-Repola Oy. Screen. 4,430,210, Cl. 209-23.400.

Twin-Cee Limited: *See—*
Schwarzli, Joseph W., 4,429,806, Cl. 221-20.000.

Tyszkiewicz, Theodore J.: *See—*
Boden, Richard M.; and Tyszkiewicz, Theodore J., 4,430,233, Cl. 252-8.600.
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Uchidoi, Tadanori: *See—*
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Ueda, Noriyoshi: *See—*
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Ueno, Takanori: *See—*
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Uke, Alan K.: *See—*
LeBlanc, James S.; and Uke, Alan K., 4,429,868, Cl. 272-93.000.

Ulanet, George D. Engine protection systems. 4,429,670, Cl. 123-198.00D.

UMC Industries, Inc.: *See—*
Heller, Werner H., 4,429,594, Cl. 74-788.000.

Umehara, Yozaburo. Tape guide means for recording and/or reproducing apparatus and method of manufacturing the same. 4,429,823, Cl. 226-196.000.

Umezawa, Hamao; Takeuchi, Tomio; Kondo, Shinichi; Iinuma, Hirosobu; Ikeda, Daishiro; Nakamura, Teruya; and Fujii, Akio, to Bristol-Myers Company. Novel carcinostatic substance and process for synthesis thereof. 4,430,346, Cl. 424-311.000.

Ungar, Israel S.: *See—*
Scher, Herbert I.; and Ungar, Israel S., 4,430,375, Cl. 428-148.000.

Unger, Lawrence C.: *See—*
Kooy, Wayne J.; Krenz, Horst M.; and Unger, Lawrence C., 4,430,012, Cl. 400-616.100.

Union Carbide Corporation: *See—*
Brode, George L.; Chow, Sui-Wu; and Hale, Warren F., 4,430,473, Cl. 524-492.000.
Chu, Nan S.; and Marlin, Lawrence, 4,430,235, Cl. 252-49.600.
Kaplan, Barbara W., 4,430,341, Cl. 424-250.000.
Kun, Leslie C., 4,430,011, Cl. 384-99.000.
Toth, Tibor E., 4,430,551, Cl. 219-132.000.

United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the: *See—*
Painter, Alfred E., 4,430,132, Cl. 149-109.600.

United States Gypsum Company: *See—*
Lat, Geronimo E., 4,430,367, Cl. 427-388.400.

United States of America
Army: *See—*
Morris, Philip E., 4,429,615, Cl. 89-33.0BB.
Energy: *See—*
Boland, Thomas J., 4,430,611, Cl. 324-77.00C.
Chi, John W. H., 4,430,291, Cl. 376-146.000.
House, Palmer A., 4,430,042, Cl. 415-1.000.
Hull, John R., 4,429,683, Cl. 126-415.000.
Jablonski, Henry; and Roughgarden, Jeffrey D., 4,429,847, Cl. 248-74.00R.
Malinchak, Raymond M., 4,429,740, Cl. 166-53.000.
Manning, Frank W., 4,430,569, Cl. 250-377.000.
Pope, James M.; and Lahoda, Edward J., 4,430,257, Cl. 252-629.000.
Schuller, Ivan K.; and Falco, Charles M., 4,430,183, Cl. 204-192.00C.
Sheffield, George V.; and Furth, Harold P., 4,430,600, Cl. 315-111.710.
Spurrier, Francis R.; DeZubay, Egon A.; Murray, Alexander P.; and Vidt, Edward J., 4,430,304, Cl. 422-204.000.
Way, Stewart; and Lempert, Joseph, 4,430,588, Cl. 310-11.000.
Young, Ainslie T.; Marsiers, Robert G.; and Moreno, Dawn K., 4,430,451, Cl. 521-64.000.
Health and Human Services: *See—*
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Ito, Yoichiro, 4,430,216, Cl. 210-198.200.
Langone, John J., 4,430,318, Cl. 424-1.100.
National Aeronautics and Space Administration: *See—*
Bill, Robert C.; and Wisander, Donald W., 4,430,360, Cl. 427-34.000.
Salomon, Phil M.; and Smilowitz, Kalman, 4,430,673, Cl. 358-213.000.
Schultz, Donald F., 4,429,537, Cl. 60-730.000.
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Guagliardo, John L.; and Dufilho, Harold L., 4,429,994, Cl. 356-28.500.
Page, Robert E.; and Brackett, Raymond B., 4,430,704, Cl. 364-200.000.
Schack, Carl J., 4,430,514, Cl. 564-496.000.
Stern, Kurt H., 4,430,170, Cl. 204-39.000.

U.S. Philips Corporation: *See—*
Meignant, Didier, 4,429,452, Cl. 29-571.000.
Segarra, Gerard; and Phulpin, Francois J., 4,430,699, Cl. 364-200.000.
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Van Kessel, Theodorus J.; Dijkmans, Eise C.; and Van Uden, Albertus J. P. M., 4,430,609, Cl. 323-350.000.

United States Surgical Corporation: *See—*
Green, David T., 4,429,695, Cl. 128-305.000.

United Technologies Corporation: *See—*
White, Richard T.; and Kudlacik, Louis, 4,429,923, Cl. 308-184.00R.

University of California, The Regents of the: *See—*
Hanson, Donald N.; and Lynn, Scott, 4,430,227, Cl. 210-642.000.

University of Pittsburgh: *See—*
Meno, Frank, 4,429,607, Cl. 84-1.180.

University of Southern California: *See—*
Masri, Sami F., 4,429,496, Cl. 52-1.000.

University Patents, Inc.: *See—*
Hruby, Victor J.; and Bregman, Marvin D., 4,430,326, Cl. 424-177.000.

Uniweb, Inc.: *See—*
Weber, Karl; Schlinger, Michael; and Beedle, Richard, 4,429,850, Cl. 248-250.000.

Uno, Tukasa: *See—*
Oshima, Harumi; and Uno, Tukasa, 4,429,769, Cl. 188-73.310.

Untereker, Darrel F., to Medtronic, Inc. Electrochemical cells. 4,430,397, Cl. 429-191.000.

UOP Inc.: *See—*
Homeier, Edwin H., 4,430,513, Cl. 564-469.000.
Imai, Tamotsu; and Hung, Chi-Wen, 4,430,517, Cl. 585-660.000.
Krause, Bogdan J., 4,430,302, Cl. 422-144.000.
Vickers, Anthony G., 4,430,300, Cl. 422-109.000.

Upjohn Company, The: *See—*
Beyer, William F.; Dankert, Harry S.; and English, James C., 4,429,584, Cl. 73-864.210.
Cho, Moo J., 4,430,340, Cl. 424-285.000.
Fraser, Thomas H.; and Bruce, Barbara J., 4,430,428, Cl. 435-68.000.
Nelson, Norman A., 4,430,502, Cl. 544-354.000.
Patt, Tom E.; Argoudelis, Alexander D.; and Marshall, Vincent P., 4,430,495, Cl. 536-16.300.
Tilgner, Peter J., 4,430,287, Cl. 264-40.600.

Urano, Fumio: *See—*
Kawasaki, Masahiro; Urano, Fumio; and Tomori, Yasumasa, 4,429,973, Cl. 354-455.000.

Urban, Joseph J.; and Huckel, Herbert E., to Hoechst-Roussel Pharmaceuticals Inc. Dosing tip. 4,430,075, Cl. 604-77.000.

Urness, Edward V.: *See—*
Schiebe, Lowell H.; Russo, Bruce E.; Urness, Edward V.; and Hohn, William C., 4,430,702, Cl. 364-200.000.

Uryu Seisaku, Ltd.: *See—*
Teramoto, Hirokazu, 4,429,775, Cl. 192-0.096.

USS Engineers and Consultants, Inc.: *See—*
Thrower, Anthony, 4,429,816, Cl. 222-603.000.

Usui, Tsuneaki: *See—*
Goto, Hiraku; Usui, Tsuneaki; and Kinoshita, Nobuyasu, 4,430,416, Cl. 430-263.000.

Utsumi, Hiroo; Sakakibara, Yukio; Ito, Teruyoshi; Iwata, Toshiharu; Ohta, Jun; Kazi, Kiyokane; Hori, Osamu; and Banno, Mitsuyuki, to Toyota Jidosha Kogyo Kabushiki Kaisha; and Nippondenso Co., Ltd. Knocking detecting apparatus for an internal combustion engine. 4,429,565, Cl. 73-35.000.

V. Kann Rasmussen Holding A/S: *See—*
Kornerup, Klaus; and Christensen, Per B., 4,429,494, Cl. 49-386.000.

Vac-Tec Systems, Inc.: *See—*
Mularie, William M., 4,430,184, Cl. 204-192.00R.

Vachet, Joel; Bruandet, Justin; and Fremeaux, Jacques, to Saint-Gobain Vitrage. Multiple glass pane with improved joints of plastic materials. 4,429,509, Cl. 52-788.000.

Vajdovich, Gyorgy; and Csorba, Istvan, to Csoszereloipari Vallalat. Process and equipment for the utilization of thermal energy of waste having been subjected to oil contamination. 4,430,512, Cl. 210-745.000.

Valembois, Pierre V.: *See—*
John, Gunter; Rainey, James H.; and Valembois, Pierre V., 4,429,678, Cl. 125-39.000.

Valentine, Gordon A., to Stanley Aviation Corporation. Dual opposed seal ring coupling. 4,429,905, Cl. 285-93.000.

Valmet Oy: *See—*
Palovaara, Jaakko, 4,429,819, Cl. 226-95.000.

van de Bult, Oelke, to U.S. Philips Corporation. Magnetically shielded carrying arm arrangement for a magnetic disc storage. 4,430,679, Cl. 360-106.000.

van den Heuvel, Anthony P.: *See—*
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VandenHoek, Harold L.; Speet, Larry A.; and Mohr, Robert G., to Steelcase Inc. Panel wiring system. 4,429,934, Cl. 339-22.00R.

Vandervaart, Gerry, to Kool-Fire Limited. Heat exchanger coil. 4,429,734, Cl. 165-29.000.

Van de Sande, Christian C.; Vandewalle, Jan J.; Van Poucke, Raphael K.; and Claes, Andre K., to Agfa-Gevaert, N.V. Method of dispersing photographic adjuvants in hydrophilic colloid compositions. 4,430,421, Cl. 430-377.000.

Van de Sande, Christian C.; Vandewalle, Jan J.; Martens, Luc K.; and Van Poucke, Raphael K., to Agfa-Gevaert, N.V. Method of dispersing photographic adjuvants in a hydrophilic colloid composition. 4,430,422, Cl. 430-377.000.

Vandewalle, Jan J.: *See*—
Van de Sande, Christian C.; Vandewalle, Jan J.; Van Poucke, Raphael K.; and Claes, Andre K., 4,430,421, Cl. 430-377.000.
Van de Sande, Christian C.; Vandewalle, Jan J.; Martens, Luc K.; and Van Poucke, Raphael K., 4,430,422, Cl. 430-377.000.

Van Dyk, Steven G. Fluid ejected and retracted tube clearance tester. 4,429,428, Cl. 15-3.520.

Van Endert, Gunter: *See*—
Tersteegen, Bernd; and Van Endert, Gunter, 4,429,852, Cl. 251-9.000.

Van Gelder, Robert V.: *See*—
Anderson, Jared A.; Van Gelder, Robert V.; Yazolino, Lauren F.; and Braun, Jimmy E., 4,430,711, Cl. 364-200.000.

Van Kessel, Theodorus J.; Dijkmans, Eise C.; and Van Uden, Albertus J. P. M., to U.S. Philips Corporation. Signal transfer device having a transfer characteristic which is adjustable in steps. 4,430,609, Cl. 323-350.000.

Vanlerberghe, Guy: *See*—
Sebag, Henri; and Vanlerberghe, Guy, 4,430,250, Cl. 252-351.000.

Van Pelt, Wilhelmus H. J. M.; and Roodenrijs, Jacobus P., to Grasso's Koniklijke Machine Fabrieken, N.V. Multi-stage countercurrent concentrating system and method and separator. 4,430,104, Cl. 62-123.000.

Van Poucke, Raphael K.: *See*—
Van de Sande, Christian C.; Vandewalle, Jan J.; Van Poucke, Raphael K.; and Claes, Andre K., 4,430,421, Cl. 430-377.000.
Van de Sande, Christian C.; Vandewalle, Jan J.; Martens, Luc K.; and Van Poucke, Raphael K., 4,430,422, Cl. 430-377.000.

Van Raemdonck, Joris, to Snauwaert En Depla N.V. Tennis racket. 4,429,873, Cl. 273-73.00F.

Van Uden, Albertus J. P. M.: *See*—
Van Kessel, Theodorus J.; Dijkmans, Eise C.; and Van Uden, Albertus J. P. M., 4,430,609, Cl. 323-350.000.

Varian Associates, Inc.: *See*—
Abbott, Seth R., 4,430,496, Cl. 536-27.000.

Varta Batterie Aktiengesellschaft: *See*—
Bechtold, Dieter, 4,430,394, Cl. 429-147.000.

Vatterott, Oskar F., to MCIBS, Inc. Actuator switch assembly. 4,430,533, Cl. 200-61.410.

VEB Elektronik Gera: *See*—
Steinfelder, Karl; Heisig, Ullrich; Schiller, Siegfried; Mehr, Dietrich; Thusse, Bernd; and Hielscher, Klaus, 4,430,687, Cl. 361-293.000.

Vecera, Milos: *See*—
Ferkl, Frantisek; Cap, Antonin; Vecera, Milos; Skala, Josef; Kopriva, Vaclav; Blasko, Michal; Pavek, Karel; Chrtek, Milan; and Blasko, Jan, 4,429,522, Cl. 57-301.000.

Venkatesan, Srinivasan: *See*—
Ovshinsky, Stanford R.; Sapru, Krishna; and Venkatesan, Srinivasan, 4,430,391, Cl. 429-40.000.

Vibrac Corporation: *See*—
Searle, Robert F., 4,430,566, Cl. 250-231.0SE.

Viccaro, John P., to Lever Brothers Company. Ammonium fluorometallate containing compositions. 4,430,324, Cl. 424-52.000.

Vickers, Anthony G., to UOP Inc. Fluid catalyst regeneration apparatus. 4,430,300, Cl. 422-109.000.

Victor Company of Japan, Ltd.: *See*—
Ishigaki, Yukinobu, 4,430,754, Cl. 455-72.000.

Victor Equipment Company: *See*—
Grant, Gerald B.; and Brune, Robert A., Jr., 4,429,585, Cl. 74-191.000.

Vidt, Edward J.: *See*—
Spurrier, Francis R.; DeZubay, Egon A.; Murray, Alexander P.; and Vidt, Edward J., 4,430,304, Cl. 422-204.000.

Vinals, Joaquin F.: *See*—
Boden, Richard M.; Tyszkiewicz, Theodore J.; Licciardello, Michael; Vock, Manfred H.; Vinals, Joaquin F.; Whalen, Patrick; and Hanna, Marie R., 4,430,354, Cl. 426-536.000.

Visidyne, Inc.: *See*—
Zehnpfennig, Theodore F.; and Reidy, William P., 4,429,953, Cl. 350-293.000.

Vits, Hilmar, to Vits-Maschinenbau GmbH. Method of crosscutting a web and stacking the cut sheets, and impact-type crosscutter for webs with sheet stacker. 4,429,602, Cl. 83-24.000.

Vits-Maschinenbau GmbH: *See*—
Vits, Hilmar, 4,429,602, Cl. 83-24.000.

Vock, Manfred H.: *See*—
Boden, Richard M.; Tyszkiewicz, Theodore J.; Licciardello, Michael; Vock, Manfred H.; Vinals, Joaquin F.; Whalen, Patrick; and Hanna, Marie R., 4,430,354, Cl. 426-536.000.

Voest-Alpine Aktiengesellschaft: *See*—
Reif, Werner; and Schuocker, Dieter, 4,430,738, Cl. 372-38.000.

Vogel, Walter: *See*—
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Volejnik, Wilhelm: *See*—
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Volk, Georg: *See*—
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Vollenberg, Werner P.; and Boehlke, Horst R. E., to Gruenenthal GmbH. Process for the preparation of 2-oxa-bicyclo [3.3.0] octane derivatives and products produced thereby. 4,430,497, Cl. 542-429.000.

Vollmer, Klaus: *See*—
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vom Hofe, Dieter; and Meyer, Klaus, to Henkel Kommanditgesellschaft auf Aktien. Process for the manufacture of a packaging container and assembly items. 4,430,068, Cl. 493-100.000.

von Platen, Baltzar C., to F. D. International, Ltd. Reaction vessel. 4,430,051, Cl. 425-77.000.

von Recklinghausen, Daniel R., to Electro Audio Dynamics, Inc. Apparatus for measurement of acoustic volume. 4,429,702, Cl. 128-746.000.

Vought Corporation: *See*—
Leach, James W., 4,429,539, Cl. 62-6.000.

Vowell, Jeff D.: *See*—
Moore, Brian B.; Rodell, John T.; Sutton, Arthur J.; and Vowell, Jeff D., 4,430,727, Cl. 364-900.000.

Vuceta, Ivan N.: *See*—
Grabovac, Bosko; and Vuceta, Ivan N., 4,429,597, Cl. 81-57.390.

Vyzkumny ustav bavlnarsky: *See*—
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W. R. Grace & Co., Cryovac Div.: *See*—
Hampel, Gerald; and Mugnai, Giorgio, 4,429,810, Cl. 222-107.000.

W. Schlafhorst & Co.: *See*—
Kupper, Wilhelm, 4,429,842, Cl. 242-149.000.

Wada, Akira: *See*—
Kurosawa, Yukio; Wada, Akira; Iwashita, Kiyoji; and Tsuda, Hideaki, 4,430,536, Cl. 200-144.00B.

Wada, Shoji. Method of manufacturing a cut tube to be used for syringe needles. 4,430,358, Cl. 427-2.000.

Wada, Toshiaki; Furukawa, Mitsuhiko; Miyahara, Michito; Shiroyama, Masaharu; Misumi, Kiyohito; and Kitahira, Takashi, to Sumitomo Special Metal Ltd.; and Nippon Tungsten Co., Ltd. Magnetic head slider material. 4,430,440, Cl. 501-105.000.

Wagner, Louis E.; Rakoczynski, Randolph W.; and Flannery, Harold F., to Ecological Professional Industries, Inc. Secure chemical waste landfill. 4,430,021, Cl. 405-129.000.

Wagner, Theodore O.: *See*—
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Waigand, Helmut, to Bosch-Siemens Hausgerate GmbH. Device for the input of adjustment values in electronic switching systems. 4,430,578, Cl. 307-115.000.

Wakabayashi, Kiyoshige: *See*—
Watanabe, Mitsuo; Kimura, Shigeyuki; Konishi, Hideki; Tsuji, Yasuhiro; and Wakabayashi, Kiyoshige, 4,429,583, Cl. 73-864.120.

Wakabayashi, Masakuni: *See*—
Mori, Naomichi; Homma, Hiroyuki; Wakabayashi, Masakuni; and Yamaguchi, Masanobu, 4,430,545, Cl. 219-73.000.

Wakefield, Anthony W. Self-immersing jet pump. 4,429,476, Cl. 37-62.000.

Waldner, Nelson D. Ostomy collector-organizer device. 4,429,424, Cl. 4-479.000.

Waldo, Paul D.: *See*—
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Walker, Clifford G. Common resonator passive laser accelerometer and gyro. 4,429,573, Cl. 73-510.000.

Walker, Donald C.; and Wagner, Theodore O., to Standard Oil Company (Indiana). Dispensing nozzle for vacuum assist vapor recovery system. 4,429,725, Cl. 141-59.000.

Walker, George L.: *See*—
LaVanture, Mark D.; and Walker, George L., 4,430,313, Cl. 423-321.00R.

Walker, Richard E. Water shedding device. 4,430,222, Cl. 210-477.000.

Walls, James F. Heat strip holder for skewer sticks. 4,429,435, Cl. 17-1.00S.

Walter, Friedrich C., to Argus Verwaltungsgesellschaft mbH. Snap closure coupling for flowing-media ducts. 4,429,713, Cl. 137-614.030.

Walter, Lothar: *See*—
Olschewski, Armin; Brandenstein, Manfred; Kunkel, Heinrich; Hetterich, Hermann; Horling, Peter; and Walter, Lothar, 4,429,926, Cl. 308-216.000.

Walters, Samuel. Spectacle mounted hinged monocular or binocular vision aid. 4,429,959, Cl. 351-158.000.

Wareham, Oliver N. Flow control device. 4,429,422, Cl. 4-192.000.

Warren, Alan: *See*—
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Warrender, David J. Pitch analyzer. 4,429,609, Cl. 84-454.000.

Wasel-Nielen, Horst-Dieter: *See*—
Sorbe, Gunter; Wasel-Nielen, Horst-Dieter; and Kandler, Joachim, 4,430,246, Cl. 252-140.000.

Watabe, Hiroomi: *See*—
Ando, Tadahiko; Shibata, Takehiko; and Watabe, Hiroomi, 4,430,432, Cl. 435-199.000.

Watanabe, Kojiro, to Nippon Electric Co., Ltd. Fast start-up system for transversal equalizers. 4,430,743, Cl. 375-13.000.

Watanabe, Mitsuo; Kimura, Shigeyuki; Konishi, Hideki; Tsuji, Yasuhiro; and Wakabayashi, Kiyoshige, to Chugai Seiyaku Kabushiki Kaisha; and Japan Spectroscopic Co., Ltd. Liquid uptake and discharge apparatus. 4,429,583, Cl. 73-864.120.

Watanabe, Noboru; and Iiyama, Hiroshi, to Jeco Co., Ltd. Inclinometer. 4,429,470, Cl. 33-395.000.

Watanabe, Tadao; Ohhori, Mitsuo; Ohta, Akio; and Kondo, Yoshikazu, to Toyo Kohan Co., Ltd. Composite metal sintered article and method of making same. 4,430,386, Cl. 428-555.000.

Waugh, Edward F. Garment expander. 4,429,439, Cl. 24-573.000.

Way, Stewart; and Lempert, Joseph, to United States of America, Energy. MHD Electrode and wall constructions. 4,430,588, Cl. 310-11.000.

Weaver, Jon N.: *See*—
Eskandry, Ezra D.; and Weaver, Jon N., 4,430,645, Cl. 340-572.000.

Webb, David E.; and Andrews, Lawrence F., to Johnson and Johnson. Orthodontic bracket assembly. 4,430,061, Cl. 433-9.000.

Weber, Karl; Schlinger, Michael; and Beedle, Richard, to Uniweb, Inc. Display panel shelf bracket. 4,429,850, Cl. 248-250.000.

Weber, Paul: *See*—
Zuch, Howard W.; and Weber, Paul, 4,429,591, Cl. 74-625.000.

Weichlein, Bernard; Chatelain, Jean-Claude; and Gaihier, Denis, to Madec Mater. Safety device for gas-fired heating apparatus. 4,429,706, Cl. 137-66.000.

Weigand, Benjamin F.; and Frech, John W., to Westinghouse Electric Corp. Digital-to-analog converter. 4,430,642, Cl. 340-347.0DA.

Weigel, Horst: *See*—
Bethge, Horst; Drauz, Karlheinz; Kleemann, Axel; Martens, Jurgen; and Weigel, Horst, 4,430,509, Cl. 562-401.000.

Weir, Donald H.; and Dabowski, Donald E., to Fox Pool Corporation. Swimming pool cover or dome bead construction. 4,429,425, Cl. 4-503.000.

Weisbrod, Helmut, to ITT Industries, Inc. Friction lining carrier member having replaceable friction linings. 4,429,770, Cl. 188-73.320.

Weisenberger, Richard J. Toroidal shaped closed chamber whistle. 4,429,656, Cl. 116-137.00R.

Weiss, Hansjakob: *See*—
Gohlert, Christian; Kanngiesser, Peter; Weiss, Hansjakob; and Wilke, Werner, 4,430,593, Cl. 310-327.000.

Weiss, Horst: *See*—
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Werthessen, Nicholas H.: *See*—
Guild, Charles L.; Werthessen, Nicholas H.; and Aldrich, Carlton W., Jr., 4,430,024, Cl. 405-232.000.

Wessels, John A. Electric vehicle with magnetic attraction to trackway. 4,429,488, Cl. 46-257.000.

Westcan Electrical Manufacturing Inc.: *See*—
Ofield, L. Ronald; Puurits, Leonhard; and Patterson, Roy A., 4,430,521, Cl. 174-65.00R.

Westdale, Virgil W.; and Hanrahan, James L., to AM International, Inc. Method of preparing a lithographic printing master. 4,430,403, Cl. 430-49.000.

Westdale, Virgil W., to AM International, Inc. Heat fusible single component toner having a polyamide binder. 4,430,407, Cl. 430-106.600.

Westdale, Virgil W.; and Hanrahan, James L., to AM International, Inc. Method of making a single component toner. 4,430,413, Cl. 430-137.000.

Western Electric Company, Inc.: *See*—
Broyer, Alfred P.; and Dines, David R., 4,429,454, Cl. 29-747.000.
Dillow, Harry M.; Sansone, Anthony E.; and Swartz, Raymond K., 4,430,385, Cl. 428-380.000.

Western Plastics Corporation: *See*—
Olsson, Robert P., 4,430,052, Cl. 425-392.000.

Westinghouse Electric Corp.: *See*—
Deis, Daniel W.; McNab, Ian R.; and Smith, Joseph L., Jr., 4,429,613, Cl. 89-8.000.
Garland, Barbara R.; and Troutman, Mark D., 4,430,368, Cl. 427-385.500.
Radford, Kenneth C.; and Pope, James M., 4,430,276, Cl. 264-0.500.
Steinbruegge, Harold A.; and Der, Chuck F., 4,430,697, Cl. 363-49.000.
Weigand, Benjamin F.; and Frech, John W., 4,430,642, Cl. 340-347.0DA.

Westra, Dan P., to Challenge Machinery Company, The. Stacking cart. 4,429,889, Cl. 280-79.10A.

Westvaco Corporation: *See*—
Chapman, William A., Jr.; and Crowley, John J., 4,429,603, Cl. 83-37.000.

Wetzel, Vernon F.: *See*—
Morgan, George W.; and Wetzel, Vernon F., 4,429,653, Cl. 114-42.000.

Wexco Corporation: *See*—
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Weydmann, Patrick: *See*—
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Whalen, Patrick: *See*—
Boden, Richard M.; Tyszkiewicz, Theodore J.; Licciardello, Michael; Vock, Manfred H.; Vinals, Joaquin F.; Whalen, Patrick; and Hanna, Marie R., 4,430,354, Cl. 426-536.000.

Wheeler, William J., to Eli Lilly and Company. 7-[2-(2-Aminooxazol-4-yl)-2-(oximino)acetamido]cephalosporin antibiotics. 4,430,499, Cl. 544-25.000.

Whirlpool Corporation: *See*—
Lyman, John B., 4,429,430, Cl. 15-182.000.

Whitaker, Ranald O. Variable speed drive with no slippage between belt and sheaves. 4,430,067, Cl. 474-244.000.

White, Richard T.; and Kudlacik, Louis, to United Technologies Corporation. Bearing support structure. 4,429,923, Cl. 308-184.00R.

Wick, Alexander E.; and Frost, Jonathan R., to Synthelabo. Phenethanolamine derivatives for use against cerebrovascular disease. 4,430,334, Cl. 424-267.000.

Widmer, Jurg: *See*—
Burge, Theodor A.; Widmer, Jurg; Meyer, Theodor; and Sulser, Ulrich, 4,430,469, Cl. 524-247.000.

Wiebe, Leonard I.: *See*—
Flanagan, Richard J.; and Wiebe, Leonard I., 4,430,321, Cl. 424-1.100.

Wiederaufbereitungsanlage Karlsruhe Betriebsgesellschaft mbH: *See*—
Evers, Heinz, 4,430,301, Cl. 422-119.000.

Wiederhold, Robert A.: *See*—
Newkirk, James S.; and Wiederhold, Robert A., 4,430,406, Cl. 430-99.000.

Wieser, James B.; and Patel, Suman H., to National Semiconductor Corporation. CMOS Polarity switch. 4,430,621, Cl. 330-9.000.

Wiget, Fridolin; and Guerin, Yves, to ETA S.A. Fabriques d'Ebauches. Method of reducing the power consumption of the stepping motor of an electronic timepiece and an electronic timepiece employing the method. 4,430,007, Cl. 368-157.000.

Wiggins, Douglas G.: *See*—
Tuhro, Richard H.; and Wiggins, Douglas G., 4,430,748, Cl. 382-50.000.

Wiktor, Dominik M., to Automatic Switch Company. Electrically operated, mechanically held electrical switching device. 4,430,579, Cl. 307-134.000.

Wilden, Rolf: *See*—
Thees, Richard; and Wilden, Rolf, 4,429,700, Cl. 128-681.000.

Wilhelm, Donald F., to Helm Instrument Co., Inc. Tie rod tension sensor. 4,429,579, Cl. 73-768.000.

Wilke, Werner: *See*—
Gohlert, Christian; Kanngiesser, Peter; Weiss, Hansjakob; and Wilke, Werner, 4,430,593, Cl. 310-327.000.

Wilkinson, Richard L., to Discovision Associates. Method for producing a recording disc stamper. 4,430,401, Cl. 430-8.000.

Williams, Charles J., to Perkin-Elmer Corporation, The. Method for detecting physical anomalies of U.S. currency. 4,429,991, Cl. 356-73.000.

Williams International Corporation: *See*—
Joy, John R., 4,429,534, Cl. 60-618.000.

Williams, John S.: *See*—
Christian, John H.; Hartung, Michael H.; Nolta, Arthur H.; Reed, David G.; Rieck, Richard E.; Tayler, Gerald E.; and Williams, John S., 4,430,701, Cl. 364-200.000.

Williams, Monte: *See*—
Ruppel, Anthony D.; Williams, Monte; and Willis, Larry, 4,429,791, Cl. 206-454.000.

Williamson, Jimmie R., Jr., to Otis Engineering Corporation. Well tool. 4,429,747, Cl. 166-321.000.

Williamson, Kirk E. Drill with polycrystalline diamond drill blanks for soft, medium-hard and hard formations. 4,429,755, Cl. 175-329.000.

Willis, Larry: *See*—
Ruppel, Anthony D.; Williams, Monte; and Willis, Larry, 4,429,791, Cl. 206-454.000.

Willson, Richard F.: *See*—
Maffitt, Kent N.; Robbins, William B.; and Willson, Richard F., 4,430,659, Cl. 346-135.100.

Willus, Charles A.; Lewis, Kenneth D.; and Langer, Julian, to Dorr-Oliver Incorporated. Feed seal for bottom feed centrifuge. 4,430,071, Cl. 494-38.000.

Wilson, David A.: *See*—
Frenier, Wayne W.; and Wilson, David A., 4,430,128, Cl. 134-3.000.

Wilson, Norman H.: *See*—
Jones, Robert L.; and Wilson, Norman H., 4,430,345, Cl. 424-305.000.

Wilson, Robert C. Log splitter. 4,429,727, Cl. 144-193.00C.

Winslow, Randy, to Clopay Corporation. Window shade clutch assembly. 4,429,729, Cl. 160-315.000.

Wisander, Donald W.: *See*—
Bill, Robert C.; and Wisander, Donald W., 4,430,360, Cl. 427-34.000.

Wisconsin Alumni Research Foundation: *See*—
Zeikus, Joseph G.; and Krzycki, Joseph A., 4,430,429, Cl. 435-86.000.

Wittmann, Erich: *See*—
Kolblin, Rolf; Keller, Wolfgang; and Wittmann, Erich, 4,429,443. Cl. 29-26.00A.

Wojnarowski, Robert J.: *See*—
Eichelberger, Charles W.; and Wojnarowski, Robert J., 4,430,557, Cl. 219-401.000.

Wolf, Alfons: *See*—
Honel, Hans; Michel, Walter; Piesch, Steffen; Schluter, Karin; and Wolf, Alfons, 4,430,494, Cl. 528-254.000.

Wolf, Elmar: *See*—
Schnurbusch, Horst; Gras, Rainer; and Wolf, Elmar, 4,430,474, Cl. 524-590.000.

Wolff, Natalie A., to Container Corporation of America. Cowboy hat. 4,429,420, Cl. 2-175.000.

Wolff, Siegfried: *See*—
Kreher, Alfons; Kuhner, Gerhard; Rothbuhr, Lothar; Turk, Gunter; and Wolff, Siegfried, 4,430,280, Cl. 264-117.000.

Wong, Stephen S.: *See*—
La Pierre, Rene B.; and Wong, Stephen S., 4,430,516, Cl. 585-533.000.
Woodhull, Ivan D., Jr., to Karmazin Products Corporation. Heat exchanger construction. 4,429,738, Cl. 165-151.000.
Woodlock, Michael Clate: *See*—
Smith, Robert P., Jr., 4,429,912, Cl. 292-263.000.
Woodruff, William W.: *See*—
Kandell, Ronald J.; Merriam, Donald R.; Root, Bernard H.; and Woodruff, William W., 4,430,530, Cl. 179-175.20D.
Woods, Jack L. Method of producing green coatings on aluminum and aluminum alloys. 4,430,169, Cl. 204-35.00N.
Woodward, James R., to Rohr Industries, Inc. Delta-alpha bond/superplastic forming method of fabricating titanium structures and the structures resulting therefrom. 4,429,824, Cl. 228-157.000.
Worley, William S., Jr.: *See*—
Cannavino, James A.; Heller, Andrew R.; Taradalsky, Morris; and Worley, William S., Jr., 4,430,705, Cl. 364-200.000.
Wright, Allen J., to Hewlett-Packard Company. Snap disc keyboard. 4,430,531, Cl. 200-5.00A.
Wright, David B.: *See*—
Ford, James M.; and Wright, David B., 4,430,179, Cl. 204-128.000.
Wright, George M.: *See*—
Blake, Larry W.; Harvel, Ervin R.; Mason, Duane R.; and Wright, George M., 4,429,693, Cl. 604-73.000.
Wu, Shane-Mau. Toy dump truck. 4,429,888, Cl. 280-1.11R.
Wu, Yulin. to Phillips Petroleum Company. Method for producing terephthalic acid. 4,430,511, Cl. 562-481.000.
Wurtman, Richard J.: *See*—
Growdon, John H.; and Wurtman, Richard J., 4,430,330, Cl. 424-199.000.
Wyman, John E., to Ferrofluidics Corporation. Ferrofluid composition and method of making and using same. 4,430,239, Cl. 252-62.510.
Wyoming Mineral Corporation: *See*—
York, William R., 4,430,309, Cl. 423-10.000.
Xerox Corporation: *See*—
Castro-Hahn, Victor, 4,429,866, Cl. 271-266.000.
Tuhro, Richard H.; and Wiggins, Douglas G., 4,430,748, Cl. 382-50.000.
Yadlowsky, Slawko, to General Foods Corporation. Low-grade coffee. 4,430,353, Cl. 426-388.000.
Yamada, Osamu: *See*—
Murakami, Hiroya; Takasaki, Mitsuhiro; Yamada, Osamu; Kamada, Atsuya; and Hori, Katsuyoshi, 4,429,558, Cl. 72-17.000.
Yamada, Takahiro; and Kuwabara, Tadashi, to Hitachi, Ltd. Method for reducing print distortion of ink drop writing apparatus. 4,430,656, Cl. 346-1.100.
Yamagata, Seiichi: *See*—
Kajita, Koji; Nakayama, Takashi; and Yamagata, Seiichi, 4,429,523, Cl. 57-328.000.
Yamagishi, Tatuo: *See*—
Yamazaki, Shigeru; Hirao, Motoaki; Yamagishi, Tatuo; Nagai, Jun; Ooi, Hiroshi; and Shinozaki, Yoshinobu, 4,430,116, Cl. 75-34.000.
Yamaguchi, Katsumi; and Okada, Hitoshi, to Clarion Co., Ltd. Reciprocating member control mechanism in tape player. 4,430,680, Cl. 360-137.000.
Yamaguchi, Masanobu: *See*—
Mori, Naomichi; Homma, Hiroyuki; Wakabayashi, Masakuni; and Yamaguchi, Masanobu, 4,430,545, Cl. 219-73.000.
Yamaguchi, Tamikazu, to Minolta Camera Kabushiki Kaisha. Relatively wide angle telephoto type lens system. 4,429,958, Cl. 350-455.000.
Yamamichi, Masayoshi; Iura, Yukio; Aizawa, Hiroshi; Ito, Tadashi; Taguchi, Tetsuya; and Uchidoi, Tadanori, to Canon Kabushiki Kaisha. Single lens reflex camera having an electro-magnetic device. 4,429,972, Cl. 354-448.000.
Yamamichi, Masayoshi: *See*—
Hosoe, Kazuya; Kinoshita, Takao; and Yamamichi, Masayoshi, 4,429,966, Cl. 354-406.000.
Yamamoto, Hachizou: *See*—
Nakatani, Hiroshi; Ishida, Masahide; and Yamamoto, Hachizou, 4,430,713, Cl. 364-405.000.
Yamamoto, Hideaki: *See*—
Shimomoto, Yasuharu; Tsukada, Toshihisa; Sasano, Akira; Tanaka, Yasuo; Yamamoto, Hideaki; and Takasaki, Yukio, 4,430,185, Cl. 204-192.00P.
Yamamoto, Kimihiko: *See*—
Ishikawa, Hitoshi; Yamamoto, Kimihiko; and Sugiura, Yasuro, 4,429,650, Cl. 112-258.000.
Yamamoto, Tomoya: *See*—
Saito, Hideomi; Yamamoto, Tomoya; Nomura, Masayuki; and Hachiya, Tomoyoshi, 4,430,500, Cl. 544-25.000.
Yamamura, Yuichi; Ichiro, Azuma; and Kobayashi, Shigeru, to Takeda Chemical Industries, Ltd. Glucosamine derivatives. 4,430,265, Cl. 260-112.50R.
Yamauchi, Hajime: *See*—
Chiba, Ko; Yamauchi, Hajime; Kawauchi, Yoneo; and Ikeda, Yukio, 4,429,885, Cl. 277-140.000.
Yamawaki, Naokuni; and Horikoshi, Katsunori, to Asahi Kasei Kogyo Kabushiki Kaisha. Immune adsorbent and adsorbing device. 4,430,229, Cl. 210-692.000.
Yamazaki, Masafumi: *See*—
Suzuki, Mikio; and Yamazaki, Masafumi, 4,430,274, Cl. 261-18.00B.
Yamazaki, Shigeru; Hirao, Motoaki; Yamagishi, Tatuo; Nagai, Jun; Ooi, Hiroshi; and Shinozaki, Yoshinobu, to Kawasaki Jukogyo Kabushiki Kaisha; and Kawasaki Steel Corporation. Method and apparatus for heating or heating and reduction raw materials for a metallurgical furnace utilizing waste gases from the same furnace. 4,430,116, Cl. 75-34.000.
Yamazaki, Yoshio: *See*—
Kondo, Shigeki; Yamazaki, Yoshio; Iketani, Tomofumi; Tanaka, Seiji; and Doi, Keiichiro, 4,430,542, Cl. 219-10.770.
Yan, Man F., to Bell Telephone Laboratories, Incorporated. Non-ohmic device using TiO_2. 4,430,255, Cl. 252-512.000.
Yanagisawa, Syozo; and Tobita, Yuichi, to Hitachi, Ltd. Vaporized fuel adsorbing canister. 4,430,099, Cl. 55-316.000.
Yanong, Procopio U. Sex aid device for males. 4,429,689, Cl. 128-79.000.
Yazolino, Lauren F.: *See*—
Anderson, Jared A.; Van Gelder, Robert V.; Yazolino, Lauren F.; and Braun, Jimmy E., 4,430,711, Cl. 364-200.000.
Yokogawa Hokushin Electric Corporation: *See*—
Ikeda, Kyoichi; Ando, Motoyoshi; and Harada, Kinji, 4,429,564, Cl. 73-32.00A.
Maeda, Masato, 4,430,192, Cl. 204-410.000.
Yokohama Rubber Co., Ltd., The: *See*—
Aihara, Tohru, 4,430,143, Cl. 156-403.000.
Yokokoji, Shoji: *See*—
Noguchi, Yoshiyasu; Yokokoji, Shoji; Saito, Shozo; and Hasegawa, Kiketsu, 4,429,457, Cl. 29-840.000.
Yokota, Takashi, to Ricoh Company, Ltd. Recording system provided with a device for correcting deviation of recording member in endless belt form. 4,429,985, Cl. 355-3.0BE.
Yokoyama, Kenji, to Nippon Gakki Seizo Kabushiki Kaisha. Power amplifier. 4,430,625, Cl. 330-297.000.
Yoneda, Masahiro; Hine, Shiro; and Koyama, Hiroshi, to Mitsubishi Denki Kabushiki Kaisha. Cleaning device for a plasma etching system. 4,430,547, Cl. 219-121.0PD.
York, William R., to Wyoming Mineral Corporation. Acid wash of second cycle solvent in the recovery of uranium from phosphate rock. 4,430,309, Cl. 423-10.000.
Yoshida, Kenichi; Hiramoto, Junichi; and Takenaka, Shinya, to Sumitomo Electric Industries, Ltd. Non-grounding checking system. 4,430,610, Cl. 324-51.000.
Yoshida Kogyo K. K.: *See*—
Nishiyama, Hissai; and Kanada, Takao, 4,429,441, Cl. 26-9.000.
Takeshima, Kiyoshi; and Masuda, Yoshinori, 4,429,438, Cl. 24-401.000.
Yoshida, Osami; Tsuji, Hidekazu; and Nomura, Yoshitada, to Mitsubishi Denki Kabushiki Kaisha. Container inspection system. 4,430,568, Cl. 250-358.100.
Yoshii, Tadashi: *See*—
Taniguchi, Seiho; Sakuma, Yuichiro; and Yoshii, Tadashi, 4,430,470, Cl. 524-269.000.
Yoshii, Takashi: *See*—
Okada, Toshio; Motoyama, Katsumi; and Yoshii, Takashi, 4,430,598, Cl. 313-497.000.
Yoshii, Tsutomu: *See*—
Nakagawa, Nobuhiko; and Yoshii, Tsutomu, 4,430,529, Cl. 179-110.00A.
Yoshimura, Isao; Mizukami, Osamu; Hata, Hideo; Kageyama, Junichi; and Kaneko, Takashi, to Asahi-Dow Limited. Cold drawn high-orientation multilayered film and process for manufacture of said film. 4,430,377, Cl. 428-213.000.
Yoshimura, Isao; Mizukami, Osamu; Hata, Hideo; Kageyama, Junichi; and Kaneko, Takashi, to Asahi-Dow Limited. Cold drawn high-orientation multilayered film and process for manufacture of said film. 4,430,378, Cl. 428-213.000.
Yoshimura, Shigeru; Ichikama, Kiyomichi; and Ueda, Noriyoshi, to Canon Kabushiki Kaisha. Apparatus for pressing original. 4,429,989, Cl. 355-76.000.
Yoshizawa, Junji: *See*—
Hidaka, Hiroyoshi; Matsumoto, Ikuo; Yoshizawa, Junji; and Kotani, Shigenori, 4,430,342, Cl. 424-250.000.
Yoshizawa, Shigeru: *See*—
Toyooka, Takashi; Aoki, Hirokazu; Sugie, Mamoru; and Yoshizawa, Shigeru, 4,430,729, Cl. 365-6.000.
Young, Ainslie T.; Marsters, Robert G.; and Moreno, Dawn K., to United States of America, Energy. Low density, microcellular foams, preparation, and articles. 4,430,451, Cl. 521-64.000.
Young, Walter M., to AMP Incorporated. Electron beam welded photovoltaic cell interconnections. 4,430,519, Cl. 136-244.000.
Youngstown Steel Door Company, The: *See*—
Fritz, William E.; and Soddy, Thomas C., 4,429,921, Cl. 308-3.500.
Yunan, Malak E., to Du Pont de Nemours, E. I., and Company. Delay detonator. 4,429,632, Cl. 102-202.130.
Zahn, Irwin. Apparatus for inserting elements into a workpiece. 4,429,456, Cl. 29-798.000.
Zahndradfabrik Friedrichshafen AG: *See*—
Ilg, Rudolf, 4,430,047, Cl. 417-273.000.
Zaltsman, Efim, to Monarch Wine Co., Inc. Bottle with a one-piece corking means. 4,429,799, Cl. 215-31.000.
Zaveri, Vikram: *See*—
Klueting, Bernd A.; and Zaveri, Vikram, 4,429,919, Cl. 297-379.000.
Zboril, Vaclav G., to Du Pont Canada Inc. Deactivation of catalyst in solution process for polymerization of α-olefins. 4,430,488, Cl. 526-84.000.
Zdanys, John, Jr.: *See*—
Hufford, James N.; and Zdanys, John, Jr., 4,430,634, Cl. 338-164.000.

Zeeh, Bernd: *See*—
Rentzea, Costin; Zeeh, Bernd; and Pommer, Ernst-Heinrich, 4,430,336, Cl. 424-272.000.
Zehapfennig, Theodore F.; and Reidy, William P., to Visidyne, Inc. Curved glass reflector and method of making same. 4,429,953, Cl. 350-293.000.
Zeikus, Joseph G.; and Krzycki, Joseph A., to Wisconsin Alumni Research Foundation. Production of vitamin B_{12}-activity substances. 4,430,429, Cl. 435-86.000.
Zell, Timothy G. Surgical procedure. 4,429,685, Cl. 128-1.00R.
Zellweger Uster AG: *See*—
Aemmer, Peter F., 4,430,720, Cl. 364-552.000.
Zenith Radio Corporation: *See*—
Kooy, Wayne J.; Krenz, Horst M.; and Unger, Lawrence C., 4,430,012, Cl. 400-616.100.
Zhukovsky, Sergei S.; Junovich, July M.; Pertsovsky, Viktor N.; Kolesnikov, Vyacheslav S.; Renzhin, Igor P.; and Rivkin, Semen I. Cold setting sand for foundry moulds and cores. 4,430,441, Cl. 501-109.000.
Ziegenfus, Barry L., to SI Handling Systems, Inc. Vehicle turntable. 4,429,636, Cl. 104-36.000.
Zimmermann, Wolfgang: *See*—
Pospich, Gunther; and Zimmermann, Wolfgang, 4,430,447, Cl. 521-53.000.
Zinck, Eugen. Method of and device for loosening agriculturally used soil. 4,429,647, Cl. 111-6.000.
Zingel, Siegfried: *See*—
Neumann, Rainer; Morgenstern, Karl; Lipper, Karl-August; Bruhne, Friedrich; Bockmann, Walter; Casper, Clemens; and Zingel, Siegfried, 4,430,181, Cl. 204-158.0HA.
Zodrow, Rudolf, to Jagenberg Werke AG. Machine for labeling objects, especially bottles. 4,430,141, Cl. 156-360.000.
Zrenner, Christian; and Kalberer, Peter, to Robert Bosch GmbH. Thermal method of testing liquids from a nozzle. 4,430,010, Cl. 374-45.000.
Zuber, Chester L., to Aluminum Company of America. Selective removal of magnesium in the consumption of aluminum used beverage container scrap. 4,430,119, Cl. 75-63.000.
Zuch, Howard W.; and Weber, Paul, to Eim Company, Inc. Drive shifting apparatus for valve control and the like. 4,429,591, Cl. 74-625.000.
Zunkel, Richard L., to Schlage Lock Company. Door control switching device. 4,429,490, Cl. 49-32.000.
Zwahlen, Helmut T. Bicycle pedal reflector. 4,429,950, Cl. 350-99.000.
Zweig, Martin: *See*—
Hampar, Berge; Zweig, Martin; and Rabin, Harvey, 4,430,437, Cl. 436-548.000.
456577 Ontario Limited: *See*—
Mulholland, John H., 4,429,643, Cl. 110-238.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 7TH DAY OF FEBRUARY, 1984

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Fernandez de Castro, Aurora L. Method for quantitative determination of renin activity in blood employing phenyl methyl sulfonyl fluoride and polyethylene glycol. Re. 31,517, Cl. 436-539.000.

Fischer, William K., to Uniroyal, Inc. Dynamically partially cured thermoplastic blend of monoolefin copolymer rubber and polyolefin plastic. Re. 31,518, Cl. 525-194.000.

General Electric Company: *See*—
Sobieski, John C., Re. 31,519, Cl. 313-332.000.

Heldt, Earl R., to Hewlett-Packard Company. Fiber optic connector. Re. 31,515, Cl. 350-96.210.

Hewlett-Packard Company: *See*—
Heldt, Earl R., Re. 31,515, Cl. 350-96.210.

Minolta Camera Kabushiki Kaisha: *See*—
Tanaka, Harumi, Re. 31,516, Cl. 354-206.000.

Sobieski, John C., to General Electric Company. Lead-in seal and lamp utilizing same. Re. 31,519, Cl. 313-332.000.

Tanaka, Harumi, to Minolta Camera Kabushiki Kaisha. Filmstrip metering device for a camera. Re. 31,516, Cl. 354-206.000.

Uniroyal, Inc.: *See*—
Fischer, William K., Re. 31,518, Cl. 525-194.000.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Bennich, Hans H.; Johannson, Stig G. O.; and Wide, Leif E., to Pharmica, Inc. Method for determining the presence of reagin-immunoglobulins (reagin-Ig) directed against certain allergens, in aqueous samples. B1 3,720,760, 2-7-84, Cl. 436-513.000.

Cryogenic Technology, Inc.: *See*—
Latham, Allen, Jr., B1 3,634,228, Cl. 210-636.000.

Dahlstrom, Baesley I.: *See*—
Hill, James E.; Dahlstrom, Baesley I.; and Fisher, Robert D., B1 4,034,210, Cl. 235-487.000.

Damon Corporation: *See*—
Sodickson, Lester A.; and Lim, F.anklin, B1 4,059,405, Cl. 436-44.000.

Dynetics Engineering Corporation: *See*—
Hill, James E.; Dahlstrom, Baesley I.; and Fisher, Robert D., B1 4,034,210, Cl. 235-487.000.

Fisher, Robert D.: *See*—
Hill, James E.; Dahlstrom, Baesley I.; and Fisher, Robert D., B1 4,034,210, Cl. 235-487.000.

Hill, James E.; Dahlstrom, Baesley I.; and Fisher, Robert D., to Dynetics Engineering Corporation. Credit card carriers and methods of manufacture. B1 4,034,210, 2-7-84, Cl. 235-487.000.

Johannson, Stig G. O.: *See*—
Bennich, Hans H.; Johannson, Stig G. O.; and Wide, Leif E., B1 3,720,760, Cl. 436-513.000.

Latham, Allen, Jr., to Cryogenic Technology, Inc. Sterile washing method and apparatus. B1 3,634,228, 2-7-84, Cl. 210-636.000.

Lim, Franklin: *See*—
Sodickson, Lester A.; and Lim, Franklin, B1 4,059,405, Cl. 436-44.000.

Pharmica, Inc.: *See*—
Bennich, Hans H.; Johannson, Stig G. O.; and Wide, Leif E., B1 3,720,760, Cl. 436-513.000.

Sodickson, Lester A.; and Lim, Franklin, to Damon Corporation. Method and apparatus for analysis of constituent carried in fibrous medium. B1 4,059,405, 2-7-84, Cl. 436-44.000.

Wide, Leif E.: *See*—
Bennich, Hans H.; Johannson, Stig G. O.; and Wide, Leif E., B1 3,720,760, Cl. 436-513.000.

LIST OF DESIGN PATENTEES

AGFA-GEVAERT AG: *See*—
Schlagheck, Norbert; and Rabold, Lutz, 272,541, Cl. D16-02.000.

American District Telegraph Company: *See*—
Thornton, H. Patrick; Dyer, Hugh D.; and Keeler, Frank R., 272,530, Cl. D13-35.000.
Thornton, H. Patrick; Dyer, Hugh D.; and Keeler, Frank R., 272,531, Cl. D13-35.000.

AMF Incorporated: *See*—
Hall, Harleston J., Jr.; Yuhas, Drew J.; Duggan, Frank J.; and Johnson, Thomas, 272,553, Cl. D21-212.000.
Johnson, Thomas; and Witte, Paul A., 272,554, Cl. D21-212.000.

Anderson, Richard C. Hive feeder for honey bees. 272,567, 2-7-84, Cl. D30-13.000.

Angelakos, Nicholas P., to Lancaster Colony Corporation. Casserole. 272,504, 2-7-84, Cl. D7-17.000.

Aracil, Claude. Razor dispenser. 272,491, 2-7-84, Cl. D6-88.000.

Argentine, Michael T.; and Enstad, Darryl L. Pet litter window box. 272,569, 2-7-84, Cl. D30-99.000.

Armin, Richard. Stringed musical instrument. 272,543, 2-7-84, Cl. D17-17.000.

Ateliers de Constructions Mecanizues de L'Atlantique Acmat: *See*—
Legueu, Paul, 272,524, Cl. D12-84.000.

Au, Albert K. H.: *See*—
Wong, Ka W.; and Au, Albert K. H., 272,534, Cl. D14-68.000.

B. F. Goodrich Company, The: *See*—
Manestar, Miroslav M., 272,526, Cl. D12-142.000.

Batts, John H.; and Duester, Everett L., to John Thomas Batts, Inc. Garment hanger body. 272,502, 2-7-84, Cl. D6-254.000.

Beirise, Jean M.: *See*—
Coons, John C.; and Beirise, Jean M., 272,533, Cl. D14-53.000.

Benedetti, Andrew J. Drink cup holder for vehicles. 272,486, 2-7-84, Cl. D3-40.000.

Bennato, Andre, to Sanistyl Creations S.A.R.L. Soap dish. 272,492, 2-7-84, Cl. D6-90.000.

Berkley and Company, Inc.: *See*—
McMickle, Robert L.; and Rumbaugh, James T., 272,556, Cl. D22-23.000.

Berkline Corporation, The: *See*—
Long, Stapleton, 272,488, Cl. D6-67.000.

Beylerian Limited: *See*—
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Caldwell, John W. Lantern. 272,563, 2-7-84, Cl. D26-87.000.

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Campbell, Conrad J.; and Willis, William D. Flooring felt compositions and method for preparing the same. T103,903, 2-7-84, Cl. 523-206.000.

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295 4,429,518

CLASS 57

293 4,429,519
4,429,520
294 4,429,521
301 4,429,522
328 4,429,523
336 4,429,524

CLASS 59

7 4,429,525
93 4,429,526

CLASS 60

39.06 4,429,527
39.281 4,429,528
433 4,429,529
520 4,429,530
588 4,429,531
600 4,429,532
606 4,429,533
618 4,429,534
641.5 4,429,535
655 4,429,536
730 4,429,537
748 4,429,538

CLASS 62

6 4,429,539
24 4,430,102
28 4,430,103
62 4,429,542
73 4,429,543
84 4,429,544
123 4,430,104
188 4,429,540
201 4,429,541
235.1 4,429,545
238.1 4,429,546
238.6 4,429,547
255 4,429,548
342 4,429,549
353 4,429,550
354 4,429,551
528 4,429,552

CLASS 65

1 4,430,105
15 4,430,106
22 4,430,107
4,430,108
32 4,430,109
104 4,430,110
114 4,430,111
335 4,430,112

CLASS 66

78 4,429,553

CLASS 70

149 4,429,556
358 4,429,554
366 4,429,555
456 R 4,429,557

CLASS 71

92 4,430,113
105 4,430,114

CLASS 72

17 4,429,558
186 4,429,559
328 4,429,560
478 4,429,561
479 4,429,562

CLASS 73

11 4,429,563
32 A 4,429,564
35 4,429,565
40.7 4,429,566
49.8 4,429,567
4,429,568
81 4,429,569
119 A 4,429,570
197 4,429,571
433 4,429,572
510 4,429,573
580 4,429,574
598 4,429,575
636 4,429,576
644 4,429,577
659 4,429,578
768 4,429,579
4,429,580
861.04 4,429,581
861.22 4,429,582
864.12 4,429,583
864.21 4,429,584

CLASS 74

191 4,429,585
410 4,429,586
467 4,429,587
484 R 4,429,588
513 4,429,589
535 4,429,590
625 4,429,591
4,429,592
687 4,429,593
788 4,429,594
804 4,429,595

CLASS 75

0.5 R 4,430,115
34 4,430,116
51 4,430,117
58 4,430,118
63 4,430,119
68 B 4,430,120
96 4,430,121
123 B 4,430,122
130 R 4,430,123
248 4,430,124

CLASS 76

36 4,429,596

CLASS 81

57.39 4,429,597
59.1 4,429,598
436 4,429,599
461 4,429,600

CLASS 83

13 4,429,601
24 4,429,602
37 4,429,603

CLASS 84

1.17 4,429,604
4,429,605
4,429,606
1.18 4,429,607
291 4,429,608
454 4,429,609

CLASS 86

36 4,429,610

CLASS 89

1.816 4,429,611
8 4,429,612
4,429,613
14 C 4,429,614
33 BB 4,429,615
36 K 4,429,616
198 4,429,617

CLASS 91

1 4,429,618
29 4,429,619
395 4,429,620
420 4,429,621

CLASS 92

93 4,429,622

CLASS 99

295 4,429,623
348 4,429,624
425 4,429,625
510 4,429,626

CLASS 100

35 4,429,627
117 4,429,628
226 4,429,629

CLASS 101

216 4,429,630
349 4,429,631

CLASS 102

202.13 4,429,632
222 4,429,633
290 4,429,634
401 4,429,635

CLASS 104

36 4,429,636

CLASS 105

168 4,429,637

CLASS 106

81 4,430,125
97 4,430,126
273 N 4,430,127

CLASS 108

25 4,429,638

CLASS 109

19 4,429,639

CLASS 110

165 R 4,429,640
181 4,429,641
236 4,429,642
238 4,429,643
245 4,429,644
346 4,429,645
347 4,429,646

CLASS 111

6 4,429,647

CLASS 112

79 R 4,429,648
229 4,429,649
258 4,429,650
273 4,429,651

CLASS 114

20 R 4,429,652
42 4,429,653
65 R 4,429,654
230 4,429,655

CLASS 116

137 R 4,429,656

CLASS 118

114 4,429,657
711 4,429,658

CLASS 119

3 4,429,659
51 R 4,429,660

CLASS 122

20 B 4,429,661
32 4,429,662
365 4,429,663
376 4,429,664

CLASS 123

3 4,429,665
41.05 4,429,666
52 M 4,429,667
56 B 4,429,668
179 H 4,429,669
198 D 4,429,670
198 F 4,429,853
339 4,429,671
369 4,429,672
491 4,429,673
531 4,429,674
558 4,429,675
571 4,429,676

CLASS 124

62 4,429,677

CLASS 125

39 4,429,678

CLASS 126

110 A 4,429,679
121 4,429,680
152 B 4,429,681
351 4,429,682
415 4,429,683
429 4,429,684

CLASS 128

1 R 4,429,685
6 4,429,686
24.2 4,429,687
28 4,429,688
75 4,429,692
79 4,429,689
92 C 4,429,691
92 D 4,429,690
303.14 4,429,694
305 4,429,695
310 4,429,696
419 PG 4,429,697
422 4,429,698
681 4,429,699
4,429,700
713 4,429,701
746 4,429,702

CLASS 131

273 4,429,703

CLASS 134

3 4,430,128
22.19 4,430,129

CLASS 136

234 4,430,518
244 4,430,519

CLASS 137

45 4,429,704
65 4,429,705
66 4,429,706
117 4,429,708
220 4,429,709
375 4,429,710
385 4,429,711
606 4,429,712
614.03 4,429,713
625.17 4,429,715
625.21 4,429,707
625.3 4,429,714
625.35 4,429,716
625.47 4,429,717

CLASS 138

30 4,429,718
96 T 4,429,719
97 4,429,720
149 4,429,721

CLASS 139

48 4,429,722
452 4,429,723

CLASS 141

27 4,429,724
59 4,429,725

CLASS 144

134 R 4,429,726
193 C 4,429,727

CLASS 148

12 B 4,430,130

CLASS 149

19.4 4,430,131
109.6 4,430,132

CLASS 152

209 A 4,429,728

CLASS 156

94 4,430,133
224 4,430,134
244.11 4,430,135
246 4,430,136
247 4,430,137
345 4,430,138
353 4,430,139
356 4,430,140
360 4,430,141
379.9 4,430,142
403 4,430,143
497 4,430,144
4,430,145
502 4,430,146
578 4,430,147
580.2 4,430,148
613 4,430,149
616 A 4,430,150
626 4,430,151
643 4,430,152
4,430,153
651 4,430,154

CLASS 159

4 S 4,430,155
47.1 4,430,156

CLASS 160

315 4,429,729
368 R 4,429,730

CLASS 162

145 4,430,157
156 4,430,158
292 4,430,159

CLASS 164

504 4,429,731

CLASS 165

10 4,429,732
16 4,429,733
29 4,429,734
60 4,429,735
61 4,429,736
125 4,429,737
151 4,429,738
159 4,429,739

CLASS 166

53 4,429,740
63 4,429,741

127 4,429,742
177 4,429,743
263 4,429,744
4,429,745
291 4,429,746
321 4,429,747
324 4,429,748

CLASS 168

45 4,429,749

CLASS 172

253 4,429,750

CLASS 173

13 4,429,751
59 4,429,752
149 4,429,753

CLASS 174

35 R 4,430,520
65 R 4,430,521
72 B 4,430,522
135 4,430,523
138 F 4,430,524

CLASS 175

88 4,429,754
329 4,429,755

CLASS 177

211 4,429,756
212 4,429,757

CLASS 178

3 4,430,525
18 4,430,526

CLASS 179

7 R 4,430,528
110 A 4,430,529
175.2 D 4,430,530

CLASS 180

19 R 4,429,758
89.14 4,429,759
215 4,429,760
271 4,429,761

CLASS 181

159 4,429,762

CLASS 182

2 4,429,763
129 4,429,764
153 4,429,765
195 4,429,766

CLASS 188

71.8 4,429,767
71.9 4,429,768
73.31 4,429,769
73.32 4,429,770
170 4,429,771
328 4,429,772

CLASS 192

0.096 4,429,775
18 B 4,429,773
53 H 4,429,774
99 A 4,429,776
111 A 4,429,777

CLASS 194

10 4,429,778

CLASS 198

347 4,429,779
424 4,429,780
448 4,429,781
677 4,429,782
731 4,429,783
744 4,429,784
852 4,429,785

CLASS 200

5 A 4,430,531
52 R 4,430,532
61.41 4,430,533
68.3 4,430,534
82 R 4,430,535
144 B 4,430,536
302.1 4,430,537

CLASS 201

19 4,430,160

CLASS 202

228 4,430,161

CLASS 203

37 4,430,162
75 4,430,163

CLASS 204

1 T 4,430,164
15 4,430,165
4,430,166
25 4,430,167
35 N 4,430,168

4,430,169
39 4,430,170
43 N 4,430,172
43 T 4,430,171
52 R 4,430,173
67 4,430,174
72 4,430,175
84 4,430,176
98 4,430,177
114 4,430,178
128 4,430,179
129.55 4,430,180
158 HA 4,430,181
192 C 4,430,183
192 P 4,430,182
4,430,185
192 R 4,430,184
242 4,430,186
243 R 4,430,187
290 F 4,430,188
290 R 4,430,189
298 4,430,190
401 4,430,191
410 4,430,192

CLASS 206

5.1 4,429,786
83 4,429,787
349 4,429,788
370 4,429,789
444 4,429,790
454 4,429,791
531 4,429,792
570 4,429,793
597 4,429,794

CLASS 208

8 LE 4,430,193
4,430,194
8 R 4,430,195
47 4,430,196
56 4,430,197
112 4,430,198
114 4,430,199
120 4,430,200
164 4,430,201
187 4,430,202
210 4,430,203
240 4,430,204
246 4,430,205
251 H 4,430,207
251 R 4,430,206
262 4,430,208

CLASS 209

3 4,430,209
23.4 4,430,210
314 4,430,211
651 4,429,795

CLASS 210

104 4,430,212
136 4,430,213
169 4,430,214
195.4 4,430,215
198.2 4,430,216
198.3 4,430,217
321.3 4,430,218
4,430,219
333.1 4,430,220
380.1 4,430,221
477 4,430,222
493.5 4,430,223
604 4,430,224
608 4,430,225
636 B1 3,634,228
638 4,430,226
642 4,430,227
665 4,430,228
691 4,430,230
692 4,430,229
745 4,430,512
783 4,430,231
798 4,430,232

CLASS 211

11 4,429,796
119 4,429,797

CLASS 215

12 R 4,429,798
31 4,429,799
216 4,429,800
254 4,429,801
344 4,429,802
366 4,429,803

CLASS 219

10.55 B 4,430,540
10.55 F 4,430,538
4,430,539
10.55 R 4,430,541
10.77 4,430,542
10.79 4,430,543
69 V 4,430,544
73 4,430,545
121 ED 4,430,550

121 LG 4,430,548
4,430,549
121 PD 4,430,547
121 PY 4,430,546
132 4,430,551
200 4,430,552
258 4,430,553
286 4,430,555
328 4,430,556
401 4,430,557
449 4,430,558
460 4,430,559
483 4,430,554
505 4,430,560

CLASS 220

247 4,429,804
306 4,429,805

CLASS 221

20 4,429,806
75 4,429,807
167 4,429,808

CLASS 222

67 4,429,809
107 4,429,810
159 4,429,811
181 4,429,812
207 4,429,813
402.13 4,429,814
452 4,429,815
603 4,429,816
652 4,429,817

CLASS 224

39 4,429,818

CLASS 226

95 4,429,819
108 4,429,820
181 4,429,821
188 4,429,822
196 4,429,823

CLASS 228

157 4,429,824

CLASS 229

1.5 B 4,429,825
23 BT 4,429,826
68 R 4,429,827
75 4,429,828

CLASS 235

95 B 4,430,561
379 4,430,562
487 B1 4,034,210
494 4,430,563

CLASS 236

78 B 4,429,829

CLASS 237

19 4,429,830

CLASS 239

177 4,429,831
204 4,429,832
224 4,429,833
327 4,429,834
338 4,429,835

CLASS 241

282.1 4,429,836
292.1 4,429,837

CLASS 242

46.4 4,429,838
107 4,429,840
107.4 B 4,429,841
149 4,429,842

CLASS 244

199 4,429,843
219 4,429,844

CLASS 246

96 4,429,839
428 4,429,845

CLASS 248

74 R 4,429,847
75 4,429,848
156 4,429,849
250 4,429,850
354 S 4,429,851
524 4,429,846

CLASS 250

211 R 4,430,564
227 4,430,565
231 SE 4,430,566
270 4,430,567
358.1 4,430,568
377 4,430,569
423 R 4,430,570
492.2 4,430,571

551 4,430,572

CLASS 251

9 4,429,852
144 4,429,855
149.1 4,429,856

CLASS 252

8.6 4,430,233
8.8 4,429,859
49.5 4,430,234
49.6 4,430,235
61 4,430,238
62.51 4,430,239
70 4,430,240
4,430,241
4,430,242
91 4,430,243
94 4,430,244
95 4,430,236
117 4,430,245
140 4,430,246
173 4,430,237
182 4,430,247
313 R 4,430,248
4,430,249
351 4,430,250
359 R 4,430,251
512 4,430,255
628 4,430,256
629 4,430,257
644 4,430,258

CLASS 254

18 4,429,857
134.3 PA 4,429,858

CLASS 260

112 R 4,430,263
4,430,264
112.5 R 4,430,265
112.7 4,430,266
147 4,430,267
186 4,430,259
239 A 4,430,268
239.1 4,430,260
244.4 4,430,269
397.1 4,430,270
404.8 4,430,261
453 P 4,430,262
458 R 4,430,271
501.12 4,430,272
546 4,430,273

CLASS 261

18 B 4,430,274
4,430,275

CLASS 264

0.5 4,430,276
22 4,430,277
4,430,278
40.6 4,430,287
65 4,430,279
117 4,430,280
118 4,430,281
127 4,430,282
4,430,283
171 4,430,284
242 4,430,285
258 4,430,286
510 4,430,288
564 4,430,289

CLASS 266

44 4,429,860

CLASS 269

40 4,429,861
47 4,429,862

CLASS 271

9 4,429,863
10 4,429,864
170 4,429,865
266 4,429,866

CLASS 272

32 4,429,867
93 4,429,868
97 4,429,869
117 4,429,870
130 4,429,871

CLASS 273

25 4,429,872
73 C 4,429,874
73 F 4,429,873
81.2 4,429,875
121 A 4,429,876
139 4,429,877
155 4,429,878
167 H 4,429,879
176 F 4,429,881
176 FA 4,429,880
177 R 4,429,882

CLASS 277

53 4,429,883

93 SD 4,429,884
140 4,429,885
207 A 4,429,886

CLASS 279

112 4,429,887

CLASS 280

1.11 R 4,429,888
79.1 A 4,429,889
259 4,429,890
278 4,429,891
407 4,429,892
414.1 4,429,893
458 4,429,894
490 R 4,429,895
624 4,429,896
646 4,429,897
678 4,429,898
689 4,429,899
4,429,900

CLASS 282

29 B 4,429,901

CLASS 285

3 4,429,902
24 4,429,903
4,429,904
93 4,429,905
315 4,429,906
373 4,429,907

CLASS 290

40 R 4,430,573
52 4,430,574
4,430,575

CLASS 292

35 4,429,908
92 4,429,909
199 4,429,910
259 R 4,429,911
263 4,429,912
293 4,429,913

CLASS 296

188 4,429,914

CLASS 297

199 4,429,915
250 4,429,916
300 4,429,917
353 4,429,918
379 4,429,919
478 4,429,920

CLASS 307

38 4,430,576
108 4,430,577
115 4,430,578
134 4,430,579
288 4,430,580
296 R 4,430,581
297 4,430,582
448 4,430,583
465 4,430,584
473 4,430,585
570 4,430,586
590 4,430,587

CLASS 308

3.5 4,429,921
6 R 4,429,922
184 R 4,429,923
187 4,429,924
189 R 4,429,925
216 4,429,926
236 4,429,927

CLASS 310

11 4,430,588
52 4,430,589
67 R 4,430,590
71 4,430,591
93 4,430,592
327 4,430,593
328 4,430,594
339 4,430,595
348 4,430,596

CLASS 312

31 4,429,928
107 4,429,929
216 4,429,930
228 4,429,931
259 4,429,932
319 4,429,933

CLASS 313

113 4,430,597
332 Re.31,519
497 4,430,598
554 4,430,599

CLASS 315

111.71 4,430,600
169.4 4,430,601

241 P 4,430,602

CLASS 318

254 4,430,603
379 4,430,604
386 4,430,605
601 4,430,606

CLASS 323

217 4,430,607
282 4,430,608
350 4,430,609

CLASS 324

51 4,430,610
77 C 4,430,611
166 4,430,612
200 4,430,613
238 4,430,614
239 4,430,615
304 4,430,616

CLASS 328

61 4,430,617
149 4,430,618

CLASS 329

166 4,430,620

CLASS 330

9 4,430,621
4,430,622
149 4,430,619
286 4,430,623
288 4,430,624
297 4,430,625

CLASS 331

108 B 4,430,626
109 4,430,627
113 A 4,430,628

CLASS 333

165 4,430,629

CLASS 334

15 4,430,630

CLASS 335

16 4,430,631

CLASS 336

120 4,430,632

CLASS 337

166 4,430,633

CLASS 338

164 4,430,634
176 4,430,635

CLASS 339

22 R 4,429,934
32 M 4,429,935
45 R 4,429,936
65 4,429,937
90 R 4,429,938
97 C 4,429,939
99 R 4,429,940
103 M 4,429,941
154 L 4,429,942
198 R 4,429,943
228 4,429,944
252 R 4,429,945

CLASS 340

52 R 4,430,637
139 4,430,638
310 A 4,430,639
347 DA 4,430,641
4,430,642
347 DD 4,430,643
347 SY 4,430,640
365 R 4,430,644
572 4,430,645
630 4,430,646
679 4,430,647
718 4,430,648
731 4,430,649
784 4,430,650
825.52 4,430,651
825.69 4,430,652
941 4,430,636

CLASS 343

5 NA 4,430,653
5 NQ 4,430,654
16 LS 4,430,655

CLASS 346

1.1 4,430,656
32 4,430,657
75 4,430,658
135.1 4,430,659
139 R 4,430,660
153.1 4,430,661

CLASS 350

3.64 4,429,954
3.76 4,429,946
3.85 4,429,947
6.8 4,429,948
96.21 Re.31,515
4,429,949
99 4,429,950
144 4,429,951
258 4,429,952
293 4,429,953
332 4,429,955
410 4,429,956
423 4,429,957
455 4,429,958

CLASS 351

158 4,429,959
212 4,429,960
226 4,429,961

CLASS 352

32 4,429,962

CLASS 353

88 4,429,963

CLASS 354

202 4,429,975
203 4,429,976
4,429,977
206 Re.31,516
224 4,429,978
289.1 4,429,979
311 4,429,980
316 4,429,981
318 4,429,982
320 4,429,983
402 4,429,965
403 4,429,964
4,429,967
4,429,968
406 4,429,966
413 4,429,970
414 4,429,969
415 4,429,971
448 4,429,972
455 4,429,973
484 4,429,974

CLASS 355

3 BE 4,429,985
3 SH 4,429,984
8 4,429,986
14 FU 4,429,987
4,429,990
28 4,429,988
76 4,429,989

CLASS 356

28.5 4,429,994
73 4,429,991
124 4,429,992
152 4,429,993
236 4,430,000
343 4,429,995
344 4,429,996
350 4,429,997
428 4,429,998
432 4,429,999

CLASS 357

5 4,430,662
53 4,430,663
73 4,430,664

CLASS 358

37 4,430,665
44 4,430,666
73 4,430,667
75 4,430,668
122 4,430,669
135 4,430,670
192.1 4,430,671
213 4,430,672
4,430,673
317 4,430,674
342 4,430,675

CLASS 360

13 4,430,676
99 4,430,678
106 4,430,679
137 4,430,680
966 4,430,677

CLASS 361

27 4,430,681
31 4,430,682
42 4,430,683
98 4,430,684
172 4,430,685
229 4,430,686
293 4,430,687
307 4,430,688
321 4,430,689
383 4,430,690
4,430,691

CLASS 362

32 4,430,692
61 4,430,693
250 4,430,694
277 4,430,695
306 4,430,696

CLASS 363

49 4,430,697

CLASS 364

162 4,430,698
200 4,430,699
4,430,700
4,430,701
4,430,702
4,430,704
4,430,705
4,430,706
4,430,707
4,430,708
4,430,709
4,430,710
4,430,711
300 4,430,712
405 4,430,713
426 4,430,703
4,430,714
4,430,715
466 4,430,716
474 4,430,717
475 4,430,718
503 4,430,719
552 4,430,720
724 4,430,721
728 4,430,722
862 4,430,723
900 4,430,724
4,430,725
4,430,726
4,430,727
4,430,728

CLASS 365

6 4,430,729
149 4,430,730

CLASS 366

107 4,430,001
139 4,430,002
173 4,430,003

CLASS 368

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73 4,430,006
157 4,430,007
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203 4,430,009
235 4,430,004

CLASS 370

30 4,430,731
54 4,430,732
110.1 4,430,733
112 4,430,734

CLASS 371

25 4,430,735
31 4,430,736
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CLASS 372

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45 4,430,740
46 4,430,741

CLASS 374

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314 4,430,293

CLASS 378

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CLASS 381

15 4,430,747
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CLASS 382

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CLASS 383

6 4,430,751
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CLASS 384

94 4,429,854
99 4,430,011

CLASS 400

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CLASS 401

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216 4,430,014

CLASS 402

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CLASS 403

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104 4,430,017
268 4,430,018
409 4,430,019

CLASS 405

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129 4,430,021
183 4,430,022
224 4,430,023
232 4,430,024
261 4,430,025
291 4,430,026
303 4,430,027

CLASS 406

39 4,430,028
63 4,430,029
146 4,430,030

CLASS 407

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CLASS 410

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CLASS 411

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402 4,430,035
416 4,430,036

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787 4,430,041

CLASS 415

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119 4,430,044
138 4,430,045

CLASS 417

55 4,430,046
273 4,430,047
383 4,430,048
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CLASS 419

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CLASS 420

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170 4,430,303
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292 4,430,306

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7 4,430,308
10 4,430,309
121 4,430,310
179.5 4,430,311
223 4,430,312
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499 4,430,315
573 R 4,430,316
574 R 4,430,317

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128 4,430,325
177 4,430,326
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181 4,430,329
199 4,430,330
248.57 4,430,332
250 4,430,341
4,430,342
4,430,343
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270 4,430,344
272 4,430,336
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273 R 4,430,331
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285 4,430,340
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311 4,430,346
322 4,430,347

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190 4,430,059
392 4,430,052
510 4,430,053

CLASS 426

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34 4,430,349
101 4,430,350
103 4,430,351
115 4,430,352
388 4,430,353
536 4,430,354
548 4,430,355
574 4,430,356
626 4,430,357

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397.7 4,430,369

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380 4,430,063

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100 4,430,757
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178 4,430,066

CLASS 474

244 4,430,067

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482 4,430,504

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496 4,430,514

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660 4,430,517

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D2—	276	272,484		190	272,500		347	272,516	D14—	13	272,532	D21—	34	272,548	D27—	42	272,564
D3—	24	272,485		251	272,501		349	272,517		53	272,533		36	272,549	D28—	64	272,565
	40	272,486		254	272,502		382	272,518		68	272,534		65	272,550	D30—	01	272,566
D6—	48.1	272,487		255	272,503	D9—	316	272,519		70	272,535		70	272,551		13	272,567
	67	272,488	D7—	17	272,504			272,520		71	272,536		120	272,552		40	272,568
	74	272,489		37	272,505		370	272,521		91	272,537		212	272,553		99	272,569
	75	272,490		70	272,506	D10—	50	272,522		94	272,538			272,554	D32—	21	272,570
	88	272,491		79	272,507		116	272,523	D15—	123	272,539		225	272,555			272,571
	90	272,492			272,508	D12—	84	272,524		145	272,540	D22—	23	272,556		31	272,572
	95	272,493		365	272,509		102	272,525	D16—	02	272,541	D23—	97	272,557	D34—	38	272,573
	113	272,494	D8—	1	272,510		142	272,526		32	272,542		149	272,558		39	272,574
	160	272,495		61	272,512		179	272,527	D17—	17	272,543	D24—	17	272,559		40	272,575
	162	272,496		62	272,511		309	272,528	D18—	12	272,544		33	272,560			272,576
	165	272,497		99	272,513		345	272,529			272,545			272,561			
		272,498		102	272,514	D13—	35	272,530	D19—	26	272,546	D25—	80	272,562	D99—	5	272,577
	188	272,499		331	272,515			272,531		91	272,547	D26—	87	272,563		43	272,578

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6 : 4,429,424
4,429,453
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